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Conference Overview

The 2014 Library Assessment Conference in Seattle, Washington was our fifth and the second one held in Seattle. Once again, conference participants enjoyed the beautiful Seattle summer weather and the evening receptions as well as participating in a variety of sessions and workshops which covered all areas of library assessment. Conference registration reached 600, a reflection of the sustained development of the library assessment community.

The growth of the conference also allowed for a more diverse set of learning opportunities to better inform and engage the community. The conference format was altered to encourage and accommodate the growing body of assessment studies, quite appropriate for our goal of effective, sustainable and practical assessment. While the number of overall presentations were the same, fewer long papers were included and two new categories, lightning talks or short papers and panels, led to greater participation and engagement. The number of posters was limited as well so more time could be spent with the presenters. The table below summarizes basic conference information since 2006.

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Session themes represented the diversity of assessment efforts and included, for the first time, sessions on data visualization, librarian liaisons, public libraries, and collaboration outside the library.

We thank our keynote speakers: Margie Jantti, Debra Gilchrist, and David Kay for their informative and engaging talks that set the tone for the conference. We also deeply appreciate the efforts of the conference volunteers, many of them from the University of Washington,
who helped with logistics and made the conference so enjoyable for everyone. Our sponsors provided both financial support and information on a range of services that can benefit the assessment community. Most of all we thank our presenters, workshop leaders, and registrants without whom this conference could not take place. You are the future of library assessment!

We look forward to the 2016 Library Assessment Conference which will be held in Arlington, Virginia from October 31 to November 2. This promises to be a very special event as we celebrate 10 years of the Library Assessment Conference.

Best regards,

Conference Co-Chairs

Steve Hiller
Martha Kyrillardou
Aspiring to Excellence: Maximising Data to Sustain, Shift and Reshape a Library for the Future

Margie Jantti
University of Wollongong, Australia

Abstract
Perhaps more than ever before, libraries face the challenge of excelling during uncertain times. As library leaders, we have a responsibility to ensure our libraries are reputed as relevant, visible, valued and contemporary. It is imperative that we seek out new methods for maximizing the data that we are invested in and make it more readily accessible and comprehensible to key stakeholders: the senior leadership teams of the library and those of the institution. Yet where does the persuasive evidence lie to demonstrate outcomes aligned to the institution’s aims? It is unlikely that library data on its own will be sufficient for future assessment, evaluation and reporting requirements. It is necessary and vital that we rethink the indicators that are markers of a healthy, thriving library as well as extend our competency and capacity to leverage enterprise and third party data platforms for both library and institutional impact.

Introduction
The principles and application of continuous improvement, quality management and assessment frameworks within the academic library sector have been widely communicated as reflected in extensive bibliographies, such as those collated by Poll. Through examination of the literature, it is possible to observe and mark the evolution of the application of quality management methodologies and the notion of excellent libraries and their iterative reform and transformation over the past decades. Numerous libraries now have access to standards and handbooks allowing for the development of the necessary competencies to measure, assess and communicate performance outcomes, representing a significant shift from collecting and monitoring data on what a library does in terms of activity with what now is considered a narrow focus on inputs and outputs.

Increasingly of late, libraries are being tasked to demonstrate and provide evidence of their relevance, value and worth to students, faculty and the university executive. Indicators, measures and analyses that may have served libraries well in the past, are now being questioned for their adequacy to communicate outcomes, impact or positive affect for the various stakeholder groups the library serves. How does the contemporary academic library enhance the faculty experience and quality of academic life, influence engagement and advance the aspirations of the parent institution? Town notes that “value requires opinions from a much broader range of stakeholders.” This advice was at the heart of the challenge that the University of Wollongong (UOW) Library embraced as part of its commitment to reshape its services, resources and capabilities for optimal alignment to the newly articulated strategic imperatives of the university.

Considering Outcomes, Impact and Value
In a period of time where colleges and universities are faced with competing pressures, including policy reform, financial challenges, increased competition and changing technologies, it is unsurprising that greater transparency, accountability and value for money is sought from all faculties and units that make up the institution. Nitecki and Abels note that a “library competes for funding and recognition, and does so in a political culture that particularly responds to faculty expressions, sometimes to the rationale of quantified return on investment, and often to the perceived value influential people attribute to the library.” Winkworth provides a useful reminder in observing that one of the many purposes of performance measurement is to influence people—their behaviour and decision making.

Given the increasing emphasis on describing and demonstrating the library’s benefit to the institution, there is merit in defining the notions of outcomes, impact and value, for until libraries
do so they will be stymied in their efforts to demonstrate institutional value to maximum effect. Hosseini-Ara and Jones describe impact (as opposed to outcome) as the long-term, overall effect of the program or service in the larger community or selected audience. Herein lies the challenge for many academic libraries; what measures and assessment tools can be harnessed to determine whether there has been a change in user’s skills, knowledge or behaviour? Has the library enhanced the faculty experience? Does the library have sufficient knowledge of how others within the institution consider and define impact and what is important to them? To gather and draw upon these critical sources of intelligence, Neal puts forward that “academic libraries must develop a more sustained and intimate understanding of their user communities” echoed by Town who states that “new valuations will need to be based on a deeper understanding of both our own [library] and user behaviour and context in a changing world.”

The Challenge
Best practice principles dictate that excellent organizations regularly measure and assess changing stakeholder requirements and the organization’s capacity to be relevant to stakeholders into the future; that it can deliver increasing value for all customers and other stakeholders. These principles are particularly pertinent in a time when academic libraries’ capacity for change, growth and innovation are being tested at unprecedented levels; change driven by, in some part, shifting economies and through increased competition within the higher education sector.

Regardless of the urgency and immediacy of these factors, I propose that as leaders of academic libraries, we should be compelled to strive to be the best possible library we can be—with the capability and motivation to make optimal use of scarce resources, drive innovation and contribute to goal attainment for the parent institution in a meaningful and impactful way. We are beholden to create environments that ensure continuous learning, adaptation and the agility needed to rise to such challenges. The consequences for not doing so can be severe. Libraries can become marginalized, downgraded, moved down the list of institutional priorities—real threats unless a library takes action to ensure it is considered to be of value and, in turn, does deliver value.

Town asks how libraries “compute” their own value Neal presses that “new and rigorous qualitative measures of success are needed.”

UOW Library acknowledged the need to refocus and strengthen its alignment to the university’s goals, notably in the areas of strategic research support, learning and curriculum transformation and cross-unit and faculty collaboration.

An Outcomes and Values Based Framework
The UOW Library has utilized performance indicator frameworks for two decades—frameworks contextualized to its vision, goals and values. While the frameworks have served the library well, the existing indicators lacked the ability to deliver a new narrative on value and impact, a narrative founded on robust evidence. To enable supported assertions on the value provided by the library, new methods for valid, reliable and ongoing data collection and analyses were required, drawing on data from both the library’s and the enterprise’s systems. The reference to enterprise systems is significant. Large numbers of universities have created sophisticated data warehouses. Library data is typically underrepresented in institutional enterprise data and reporting systems. Yet these are the “go to” destinations for the senior planning staff, the university executive, deans, council, board, etc. to gather essential data and information for understanding how the institution is performing across its many learning, teaching, research and business functions.

In 2010, a commitment towards rebalancing the library’s services to align with the research, teaching and learning goals of the university was cemented, influenced by the vice-chancellor’s strategy to reposition and enhance the reputational standing of the institution. The organizational structure of the time would soon lose relevance due to the imbalance of how services were targeted (heavily weighted to learning and teaching) and limited resources for research.

The review of the library’s Performance Indicator Framework (PIF) was thus centered on the question: what are the indicators of a successful thriving library? The examination of this question was coupled with an assessment of the library’s
understanding of the current university landscape and, therefore, its alignment with the stated aspirations of the university.

At a minimum, the library sought to create a measurement and assessment framework that would enable it to:
- demonstrate value and impact—moving beyond measures of satisfaction and usage;
- better assess the demand and uptake of services—to evaluate relevance;
- improve the capture and reporting of continuous improvement initiatives; and
- create a new narrative for communicating our role and unique contribution to the university’s strategic agenda.

The results of this assessment revealed the imperative to develop a deeper and nuanced understanding of the needs of our students and the staff of the institution. The new UOW Strategic Plan also provided numerous signposts as to how the executive leadership articulated and prioritized their transformation agenda.

Securing new sources of business intelligence became an immediate priority. Initial activities included establishing new “listening” systems in the form of academic outreach, targeting researchers and senior leaders of the institution—groups who typically eschewed standard approaches for eliciting feedback. The results were revealing on a number of fronts: many were skeptical that the library had anything of value to offer, others pointed to an array of real or perceived barriers to their research activity.

Simultaneously, work had commenced to rigorously query: what is the value to the student when they use library information resources? This became the catalyst to collaborate with the UOW Performance Indicator Unit to conjoin datasets from the library (e.g., borrowing activity and electronic resource usage) with student data collected by the institution (e.g., demographic, enrolment affiliation and status, etc.) to create the Library Value Cube. Separated, these data silos revealed a small and fragmented story about one facet of the student experience. Together, a compelling new narrative emerged revealing insights into the value of using library owned or subscribed resources—effectively demonstrating a positive correlation between students’ use of library resources and their academic performance (i.e., their grades).

These activities were pivotal in reframing the library’s approach towards thinking about impact and value and distilled to the notion of students and faculty being deserving of a “dividend” for investing their time, effort and energy in using and engaging with the library’s services and resources.

The new sources of business intelligence were influential in the identification of a new indicator set. The language used to define the indicators and articulate their purpose (see Table 1) was selected to unambiguously communicate UOW Library’s priorities for performance:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Purpose</th>
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<tbody>
<tr>
<td>Demand</td>
<td>To ensure we are providing the right mix of services and resources; that our capacity to supply services and resources is being absorbed through client transactions</td>
</tr>
<tr>
<td>Operational excellence</td>
<td>To encourage continuous improvement; working effectively and efficiently with available resources</td>
</tr>
<tr>
<td>Learning and growth</td>
<td>To encourage the continuous alignment of people’s professional capabilities; ensuring that we anticipate the competencies and capacities needed now and into the future</td>
</tr>
<tr>
<td>Impact</td>
<td>To encourage maximum alignment of library operations with UOW goals; the contribution our services and resources make to the realisation of UOW goals</td>
</tr>
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For example, through the lens of the PIF, we actively monitor the indicator of demand, as to who to target: priority audiences; the breadth and depth of outreach and engagement (students and faculty); outcomes of consultations (i.e., services valued, resources requested, service gaps and opportunities) alongside services delivered, transactions and consumption of available resources.

Through assessment against the PIF, the library has revitalized consideration of its organizational strengths and weaknesses and thus potential for continual growth. It has become more outward-facing and opportunistic, seizing opportunities to fill service and resource gaps that play to the library’s strengths and unique capabilities. This has been particularly evidenced in new research services.

Like many other universities, research quality and institutional reputation are high on the strategic agenda. The data emanating from academic outreach activities provided critical insight to what the researchers valued. As Town noted on experiences at York, “by asking what users value, instead of what they want, need or rate as satisfactory, we received answers which were surprisingly different to what we had learnt through quality approaches.”

Importantly, the intelligence gathered through the assessment of demand has touched every aspect of the library’s business, through the creation of new services, extending capacity for scale and volume, changing and improving workflows, staff skills and competency attainment and structural design. In sum, it has reshaped the library.

Results and Outcomes
To what effect has the new PIF had at the UOW Library? We acknowledge the real challenges of developing measurement systems to assess outcomes and impact. Yet early examples have resonated with the university executive, including:

- Student academic performance (Library Cube)
- Collaboration success (learning and teaching and research); leveraging synergies to attain agreed outcomes
- Professional course accreditation
- Research publications—accessibility and visibility (rankings and other “excellence in research” initiatives)

It must be stressed that the approaches chosen and subsequent evidence is highly contextual to UOW, reflective of the institution’s goals and values. We have some assurance that the approaches are reasonably sound as they align on a number of fronts to published guidelines (e.g., the RIN and RLUK: the Value of Libraries for Research and Researchers (see Table 2)). Assessing our contribution to research, outcomes and effect can best be described as being intermediate outcomes and benefits (RLUK).
### Table 2—Mapping against RIN and RLUK Intermediate Outcomes and Benefits

<table>
<thead>
<tr>
<th>Intermediate outcomes and benefits (RIN, RLUK)</th>
<th>UOW Library—evidence</th>
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<tbody>
<tr>
<td><strong>Wider institutional role</strong></td>
<td></td>
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<tr>
<td>• Centralised publications management for government reporting—captured outputs up 37% since 2010—results linked research block grants</td>
<td></td>
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<tr>
<td>• Governance:</td>
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<tr>
<td>o Institutional Repository</td>
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<tr>
<td>o Open Access Policy</td>
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<tr>
<td>• Hosting UOW Journals, conferences (Institutional Repository)</td>
<td></td>
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<tr>
<td>• Minting DOIs</td>
<td></td>
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<tr>
<td>• Academic Promotion and Probation—provision of research impact profiles</td>
<td></td>
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<tr>
<td><strong>Researcher focused services</strong></td>
<td></td>
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<tr>
<td>• Academic Outreach</td>
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<tr>
<td>• Research Impact Analysis Service:</td>
<td></td>
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<tr>
<td>o Research Impact Profiles</td>
<td></td>
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<tr>
<td>o Journal Activity Reports</td>
<td></td>
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<tr>
<td>o Citation snapshots (recruitment and promotion)</td>
<td></td>
</tr>
<tr>
<td><strong>Better informed researchers</strong></td>
<td></td>
</tr>
<tr>
<td>• 2,419 Academic Outreach Consultations (Jul 2011–Dec 2013)</td>
<td></td>
</tr>
<tr>
<td>• 1,129 research impact analysis reports (Jul 2011–Dec 2013)</td>
<td></td>
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<tr>
<td><strong>Increased visibility of research</strong></td>
<td></td>
</tr>
<tr>
<td>• Significant growth and population of content within the institutional repository (33% more full-text content since 2012)</td>
<td></td>
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<tr>
<td>• 205% increase in downloads from 2011–2013</td>
<td></td>
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<tr>
<td>• Significant improvement in international rankings of repositories for visibility (40th world-wide—Source Webometrics—Ranking Web of Repositories)</td>
<td></td>
</tr>
<tr>
<td><strong>Improved institutional understanding of information assets</strong></td>
<td></td>
</tr>
<tr>
<td>• Research data management guidelines</td>
<td></td>
</tr>
<tr>
<td>• Institutional repository feeds data into enterprise systems that produce research publication reports</td>
<td></td>
</tr>
</tbody>
</table>

RIN and RLUK describe end benefits as: increased potential readership of research, more research income, higher quality research, recruitment and retention of higher quality researchers, more efficient research, more satisfied researchers, greater research output and more motivated researchers. The activities described above will contribute to many of the desired end benefits; however, more time is required to assess impact.

**Learning Analytics and UOW Library**

Student progress, engagement and retention are critical performance outcomes and key success indicators for universities. Performance influences reputation, funding and rankings. The capacity and capability to mine the rich sources of data housed in institutional data warehouses offers distinctive competitiveness through improved knowledge and analysis of how and when (or importantly when don’t) students engage with university life. Through analysis of students’ and associated services’ data (e.g., library usage),
universities have the potential “to provide a predictive view of upcoming challenges, both for the institution and for students.” UOW Library’s experience with the analysis of student usage data and their academic performance (enabled through the Performance Indicator Unit) has offered a new foray for the concepts of impact or affect. More recent developments driven through the newly formed Business and Learning Analytics Unit point to new models for the analysis and visualization of the student experience, by campus, faculty affiliation, schools and the individual. While this work is in formative development, library data (enabled through the development of the Library Cube) is being drawn in, providing faculty with multi-faceted views and insight as to whether students are engaging with critical services and applications and to then make the determination as to whether this is indicative of potential risk. This is an important and significant milestone in terms of how library data can contribute to the success goals of the institution.

Conclusion
To excel in challenging times, there is an imperative to seek out new methods for maximising the data libraries are investing in and make it more readily accessible and comprehensible to key stakeholders. The technologies that are now offered through institutions and those that are offered through commercial means present a plethora of opportunities to leverage and exploit the data we acquire and collect. Through leveraging such datasets to produce information and meaning (evidence) a narrative of value becomes increasingly tangible and compelling.

These datasets, if captured and assessed in isolation of the parent institution’s strategy, goals and aspirations will soon lose meaning and relevance. The approaches chosen at the UOW Library, therefore, are highly contextualised to current goals and aims, and its agility will continue to be tested as contexts change over time.

The review of the library’s assessment framework was pivotal to the realignment of resource allocation and services to strategic priorities. We are heartened by the increased fluency and confidence of researchers in understanding their research profile and impact and their informed decision making in where to publish. We are excited by the prospect of library data being integral to learning analytics, where the library contributes to understanding of student and risk factors. Leveraging data has been a strategic and deliberate approach to ensure that the library is positioned to be considered viable and relevant, that it is an indispensible partner to the institution, now and into the future.

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Leading with Strategy and Evidence

Debra Gilchrist
Pierce College, USA

Convincing librarians that they should be engaged with assessment is, fortunately, an old conversation. We have progressed beyond basics and grown into a strong, viable library assessment community. Simultaneously, higher education in general has changed equally as much. While we have been focused on library assessment, our institutions have been designing effectiveness strategies, becoming data savvy, and determining gaps in student achievement. It is critical that librarians move beyond our own internal assessment agenda and engage at the institutional level, partnering and helping to lead the comprehensive assessment future.

You all are the leaders in this area—those that are thinking creatively and deeply about this work. What will you do Monday morning, next week, or next month to push the agenda, and move the library to that center? An article that has stayed with me for over 20 years was written in 1991 by Patrick Hill, then provost at Evergreen State College in Olympia, WA. It was entitled “Who Will Lead the Reform of Higher Education: Librarians, of Course!” While he was primarily addressing the classroom experience, I am still confident that his confidence could be applied to today’s assessment efforts. What could transformative leadership with assessment reform look like, and what should library assessment leaders be doing to make that happen? How can we use the information and ideas presented at this conference to lead with strategy and evidence?

I want to start our discussion today highlighting a few philosophical elements about outcomes assessment so that you know what grounds me and frames my thinking. My primary goal is to create a culture of inquiry, where our curiosity about student experience is so keen we explore it consistently in every arena without a second thought; this work is about the student experience—they are our focus. My interest is as strong regarding the process students use to inquire and how they think about their approach to information as it is about the product of their work; it is important to assess what we care about and what is meaningful, not just what can be assessed because it is easy. Assessment is a continuous cycle we consciously engage at the beginning of project design and completes with an analysis of needed changes; the overall intent of library assessment is demonstrating value, contribution, and relevance within our institution, not just determining quality of library programs, facilities, collections, education, and services.

Higher education has successfully transitioned from a teaching framework to a learning framework, and the library has been a part of that change. In this environment, the necessary next steps are for librarians to not only be strong educational partners, but take a firm step to being educational leaders. With that as our goal, then, what does it really mean to be an educational leader and how does assessment contribute to that endeavor? Evidence and data generally follow, so how do we lead with assessment work? What does it mean to lead with evidence that generally follows? How do we use the information, strategies, philosophies, and tools that will be presented to us over the next few days at this conference to move these initiatives to the next level? Today I want to outline four thoughts for us to consider today. I’m sure you will have ideas to add to my list. They are not new or radical, but I hope the timing and the juxtaposition of these ideas will spur new thinking for you.

#1: Contextualize library assessment within the framework of institutional priorities.

Librarians need to be actively and directly focusing on helping our institutions close the gap on their largest goals. What are the top concerns of our presidents, provosts, and key administrators and how can the library work to address them, care about them, and demonstrate relevance to them? What are the key challenges at your college and how can the library assist in addressing those challenges? Assessment coordinators and all of us
involved in assessment work need to be searching for opportunities to make those institutional connections, not just determining how to evaluate library programs, services, and activities. After learning the institutional outcomes, goals, and key ventures, assessment leaders should jumpstart the brainstorming about how the library can strategically align. One of the things I advocate in integrating information literacy into courses is to not talk about information literacy as additional content faculty have to fit into their courses, but instead to discuss what's missing from student work for the course, and use information literacy as the problem-solver for that faculty member. In that way, the librarian and information literacy are a solution. I would like to make the same parallel with assessment; helping resolve and further our institution’s real concerns and issues is our next challenge. The goal is not to force the library assessment into the equation, but letting it “side up” and fully partner to help provide the evidence your institution needs to make decisions. It is critical we are engaged in campus endeavors so that we know what the real problems and concerns are that our college or university is trying to address and making sure the library assessment efforts align.

Our knowledge about these issues can come informally, as well as formally. What do you hear in speeches? What differences and similarities do you hear when your president is addressing various audiences? Where is the money going? Sometimes I have felt like the kid in class with their hand raised trying so hard to get the teacher’s attention: “Hey look at us we have great things in the library, the library is a great place if you’d only see it.” But it is really our job to take that step and make the library contributions evident. In addition to assessing library programs, services, collections, and instruction, I ask you to consider an even greater shift to looking at the factors the rest of the institution is examining, drawing meaning from that analysis, and then determining what the library needs to add to those efforts.

And lastly, leaders need to know how their college/university measures its overall institutional effectiveness. Do you know what those measures are, what the process is, how to begin getting the library’s efforts into major institutional effectiveness reports. I would like to give you one example from my own institution. Pierce College is a comprehensive community college in Washington State that serves 13,000 students on two campuses as well as servicemen and women at a local military installation. Pierce uses a scorecard to define mission fulfillment using a series of metrics. For example, under the indicator for Retention and Persistence, the metrics include annual and quarter retention, transitioning of pre-college students to college-level courses, course completion, and graduation rates. These metrics combine to provide an overall measure for the Retention and Persistence category.

In an effort to connect to institutional efforts, the library analyzed the metrics in the scorecard to determine where they could have impact. They selected four areas of focus: Student Achievement Initiative, Retention and Persistence, Core Abilities, and Department and Program Outcomes. For each of these areas, a plan was developed to demonstrate how they were assisting the institution in moving the needle on that metric. The measure that was the most critical to the institution, Student Achievement Initiative, was prioritized by the library as the first it would explore and develop.
Strategy went into that decision. Student Achievement Initiative is a performance funding system for the Washington community and technical colleges. Its purposes are to both improve public accountability by more accurately describing what students achieve from enrolling in...
our colleges each year, and to provide incentives through financial rewards to colleges for increasing the levels of achievement attained by their students. It represents a shift from funding entirely for enrollment inputs to also funding meaningful outcomes. Categories of measures include moving students from pre-college to college courses and developmental education emphasizing college readiness. Since it was a performance funding system, the librarians felt that it would be high profile, high importance, and the library’s program could have direct impact on the measures.

Since all community colleges in the state were working under the same performance model, Pierce library invited other colleges to join them in designing a project that would identify information literacy learning outcomes appropriate for pre-college students, design instruction and assignments, and use standardized rubrics to assess student learning in pre-college courses. A grant from the state library supported the work. By combining with other libraries on the project, the number of students in the test project would be significantly higher than if Pierce library pursued the project alone, and the collaborative effort brought a higher range and level of ideas to the development of the project elements. The specific research question that was pursued was: Does information literacy make a contribution to overall learning and transition for pre-college students? The project consisted of librarian-led instruction for pre-college students and an assessment where students demonstrated their information literacy abilities within a course assignment. The assignment and the grading rubrics were collaboratively developed with the pre-college faculty and normed within the colleges and across the state.

Over the course of one year, libraries collected and reported data to document student achievement of the specified information literacy outcomes. Data was used to explore the impact of the information literacy instruction on achievement and transition for pre-college students. The results of the two-year project revealed that students who participated in the project made considerably greater progress and achievement as measured by student achievement points. Student Achievement Initiative points per student for participants was 2.8 compared to 1.6 for non-participants. Similarly, the total points-per-student for project participants was 3.3 compared to 1.7 for non-participants. The average points per student were higher for each year of the project, and in some cases the differences were substantial.

This library-designed assessment project demonstrated information literacy instruction improved student achievement, which provided Pierce with more student achievement points, which meant increased funding for the college. In addition, it provided a way for the library to be at the center of key campus conversations and have solid evidence that their instruction made a difference. The library’s efforts were discussed with the Board of Trustees when the Student Achievement points were awarded, and then again when the biannual scorecard was published.

#2: Respond to Research that Aligns with Identified Institutional Priorities.
Libraries have been effective in establishing assessment efforts and measuring the quality of library facilities, learning, and collections. We have started to link the library to the institutional priorities, as discussed previously, and using and developing our professional body of research and assessment. Now it is important that we look beyond the library literature for our research agendas; it is essential that assessment coordinators and leaders know the higher education research literature. Librarians need to be searching for elements in the higher education and learning research that have the potential to connect with or completely reframe current assessment activities. Uncover the research. Know what your institution is up to and jumpstart the librarians brainstorming about how the research, the library, and the college/university goals can align. This will help assure we are leaders, not responders.

Looking at the research reveals factors that lead to student engagement and persistence. We have the opportunity to look hard at this research to see where we connect and how we further student experience. For example, there are points in the research of Tinto, Chickering and Gamson, and McLendon, and Kuh that are highly relevant to library outcomes. These include:

- **Active Learning Engages Students.** How will all librarians excel at teaching and incorporate active learning into all classes. How is the library classroom and the general library structured to foster active learning?

- **Structures beyond the Classroom Make a Difference When They are Designed**
to Foster Learning. How does the library become even more of a learning space and viewed by students as key?

- Feeling Connected Increases Retention. Libraries have perfect environments for establishing meaningful relationships with students in ways that count. How can those opportunities increase and become even more significant? How can assessments be designed that demonstrate that contribution?

Leading means linking library strategies with research and then with key campus issues in order to demonstrate how libraries are actively increasing student engagement and persistence. As an example of going one layer deeper, our campus leaders look at everything that comes out of the Community College Research Center at Columbia University so I automatically know that connecting to it in some way will resonate. One study they recently released was titled “I Came in Unsure of Everything.” It focuses on shifts in confidence that happen for our students, noting that confidence is shaped in part by past academic experiences and misconceptions of college upon entry, but continually shifts as a result of student interactions with campus personnel. Student confidence is subject to change, based on one’s experiences in college. This research encourages us to create opportunities for students to experience “earned successes”—identifying their own strengths and needs and providing guided practice to accomplish challenging tasks. They particularly said that opportunities for guided practice of academic skills led to increased confidence and an intention to employ them. This need and the library’s programs are natural partners. These types of studies provide opportunity for libraries. It may be a leap for some campus units, but not for libraries. If students know how and where to inquire, their confidence to deal with new material and engage new topics in and out of the classroom will increase.

Evidence-based decision making is expected by our administrators, so the fact that libraries are linking programs and actions to a research study, and at the same time trying to solve retention, not just further the library, gives us a really strong foundation to stand on. It acknowledges that we are thinking big picture and contributing to the whole. I believe that non-cognitive development will become increasingly more important to higher education and student success. We need to be ready and aware.

For example, my college is a member of Achieving the Dream, a national network of community colleges focused on improving retention, persistence, and graduation rates. Our library will get a lot of response from our president and chancellor if librarians are assessing activities that align with the Achieving the Dream research, principles, and best practices. Our library has learned to not bring anything to the table if it is not focused on a key initiative. What is it at your institution that will do the same?

I recently went to Disneyworld and stayed at a Disney hotel. A “Magic Band” issued at check-in serves many functions for guests. It was my room key, payment system in and out of the park (I merely had to press my band to a Mickey figure at the cash register in any of the parks or restaurants to pay for meals or souvenirs and Mickey would light up to signal a successful transaction), assigned my fast pass for rides in the park, linked my group of friends so we could sign up for rides and activities as a group, etc. With all of that information, consider what they can predict about visitor behavior within the Disney facilities. I tell you this story because predictive analytics will be part of our future in higher education as well. I do not want to imply that we will be putting arm bands on our students and monitoring whether they really do go to tutoring or whether they order vegetables at the dining hall. Disney is a company with a business model and we are colleges and universities
with an education model. But I do believe there is potential in looking at the role of predictive analytics and determining what that power is for us. Right now, we have some widespread but mostly very individualized student success initiatives occurring without an infrastructure to understand what works, when, and for which students throughout the organization. Diverse campus units are approaching efforts from their individual perspectives. Many colleges and universities are contracting with companies developing data analytics platforms that connect our disparate systems, data, and initiatives to gain insight into what works and what does not and for whom. I have a mental image of the paths across the quad—they serve to interconnect, and many of those paths were established because students initiated patterns. These huge predictive databases will do the same. Analysts are looking at every bit of data an institution has to offer and seeing what correlations they can make, and more importantly about what predictions they can make about what students should do to be successful.

One company I am particularly paying attention to is Civitas out of Texas. Mark Milliron is their CEO—perhaps you have seen some of his very engaging TED talks or heard him speak at a conference. What sets Civitas apart from other companies in the same business is their extensive modeling based on actions of the health care industry. Just like a doctor cannot make a patient take their meds or get enough sleep, we cannot make a student study. But Civitas takes all of these diverse data points that can be very inconsistent, and uses very sophisticated modeling to determine relevance, relationship, and power. They conduct this analysis at the student level so that it is individualized. But in addition they emphasize the role of the front line professionals by sitting down with the data and learning together what the data models mean and what to do about them. Similar to the medical field, Civitas works with institutions to design strategies that increase the likelihood that students will respond to the intervention. They examine trends and changes over time, demographics, student activities, activities around key events, social networks...everything.

The argument with predictive analytics is that it moves us to action more than descriptive analytics. When we inquire, we are more on the left side of this grid with perhaps knowing or understanding what is going on, or just being intellectually curious. Predictive analytics are intended to move us further along the change spectrum to best practices and even becoming student success wizards. Companies such as this are mining huge amounts of data from every system imaginable to make powerful predictions. The big question is what data will the library have ready? How are we involved with these projects?

We need to think strategically, but also fast because this work is happening, and our data is not normally part of what is accessible through mainstream campus computer systems.

#3. Know the directions higher education is trending.
Library assessment professionals—and that is all of us no matter what our job—need to keep abreast of where higher education is going and very strategically plan ahead. We must be early adopters and figure our niche early. We cannot afford to lag.

You might guess that predictive analytics is one of those major developments. In addition, some of the trends I am watching that I think are relevant to library efforts:

- Competency based education. Western Governors University (WGU) is a big player in the west, and Southern New Hampshire University is playing the same role in the east. Competency learning is what has been categorized as a disruptive innovation, and will be a major game changer. For those that do not know WGU, it is a competency based program where students must demonstrate every outcome and sub-outcome in a course at a grade of B or better before moving on within the course to subsequent courses. They can move through the curriculum as fast as they are capable, so it is well suited to non-credentialed individuals already working within a field. It recognizes students come to us with skills and knowledge that can be immediately applied. The faculty role at WGU is disaggregated, so the assessments are designed by a group of faculty who do not do the teaching. WGU has no library—they use all online materials and students use only open sources. Several of the Washington community colleges are designing a version of the WGU model for the associate’s degree, and I am hoping that our libraries will be active contributors, assuring that critical thinking and evaluation of information are
embedded within assignments and assessments and serving as more than a consultant in finding open source materials.

- Early alert systems and dashboards will take on a much larger role. They will be interactive and the predictive analytics will be embedded, offering students options just as Amazon does now with the books we purchase. The dashboard will help students make decisions and understand where they are and the implications of being there. What are the library indicators that need to be in that dashboard? Should research paper analytics be included? We have an information competency requirement at Pierce—how do we use a dashboard to inform students where they are on that learning grid and what they can do to strengthen their information skills and strategies? It started me thinking of the system the University of Minnesota designed several years ago that calendared the steps of the research paper and sent e-mails to students at different points in their research process. What does that type of activity look like when it also is partnered with learning analytics? Perhaps early warning and early intervention can be assignment based and part of course activities, or a co-curricular transcript that has institutional requirements. Students must comply with both sets of requirements.

- We will intervene more with students and not just let them sink or swim. Intrusive advising, tutoring, and perhaps even intrusive reference will all be a part of a students’ life. What evidence do libraries need to be building right now to prepare to be a part of the design of those intervention systems?

- The assessment of outcomes will become more holistic. This will not be as much of an adjustment for us because of the way librarians currently partner with faculty. But for many faculty, it will be a considerable transition.

- Academic freedom will shift in this assessment world and become more student centered. Faculty will need to demonstrate students are learning, and that they have made adjustments to impact that learning. Unfortunately, our current definitions and practices allow for variation in student learning. In the future, educators will flex more because it is good for students. Academic freedom was designed around the faculty member, and just as we have shifted from teaching to learning, I believe we will see faculty-designed shifts in this arena. The math faculty at my college are a good example as they took the initiative to examine student success for each individual course outcome, and then traced that student success into subsequent courses to see what instructional strategies resulted in greater retention and transference of learning. They are now looking to design common assessments for more consistent analysis and tracking. All of their efforts were faculty designed and led, but student considerations were driving their goals, not individual faculty choice. The Board of Trustees grants tenure at my college and requested a greater focus on learning be visible in the tenure packets. We responded by adding a section to the tenure process where faculty analyze learning outcomes and design interventions in their annual tenure packet. The point of the analysis is not necessarily to demonstrate achievement of outcomes—in fact faculty are encouraged to discuss difficult outcomes and situations—but to show they are a reflective, responsive educator. In this way faculty can take risks, try new things, and demonstrate how they are responding. What could it look like if librarians focused on learning outcomes throughout a student’s career? What does a developmental teaching and assessment project look like in practice?

- Non-cognitive assessment and learning holds great potential for libraries. Another research model I have just started to look at is productive persistence from Carnegie Mellon. It is focused on math but has a great deal of potential for libraries. Productive persistence focuses on the psychological strategies for student success such as having the skills and habits and know-how to succeed in a college setting; feeling socially tied to peers, faculty, and the course they are in; and believing they are capable of learning. For libraries, productive persistence might mean discovering how to increase help for students struggling with the right questions, positively framing their persistence, and understanding and applying the productive persistence psychology at every point where we engage students. What are all the opportunities for us to link to this research and similar research regarding the non-cognitive elements essential to college success? The reason I started to look at this study was that our chancellor heard about it at a conference and mentioned it in meetings. She
referred to it several times, so I knew it made an impact on her. I investigated it because I value her judgment, but also because I felt a responsibility to learn more of where she wanted the college to go. There is a political and a strategic element to assessment work that libraries all need to consider, which ties back to the institutional priorities elements I discussed earlier.

I am encouraging librarians to take the lead in reformulating our traditions in ways that are student centered. Work in groups to analyze outcomes, talk about problems in the classroom, and open up the conversation to taking charge of the learning and improving based on what is visible in student work. I do not consider all of the library’s activities to be wrap-around services, but some are. Wrap-around services are going to get more attention than ever before—their time has come. How can libraries align with student services and tutoring and assist/partner with their efforts? Should colleges administer an entrance assessment on research strategies just as we do with English and math placement? If so, there would be an opportunity at the first advising session to suggest what students could do to increase their chances of success with research and inquiry. What phone apps need to be developed so that we are pushing expectations out to students and not just waiting for them to enter the library or use the website? How can those apps connect to the student success dashboard? How can the library intervene? What can we pilot to assess interventions based on patterns of need, not just on what we think students need? What are the marketing strategies the library can use with posters in every classroom?

In summary, I hope you will be inspired to engage in campus endeavors so that we know what the real problems and concerns are that our institutions are trying to address and assuring that the library assessment efforts align. One of the things I most want to hear from our library dean are things like “because students scored X on the CCSSE, the library has chosen to Y.” Place the library at the center of the solution. Draw meaning from and figure out what we add, how we add it, or what we need to add. I hope you will be inspired to delve into research on learning and student success beyond the library literature and determine the applications. I hope you will be inspired to think creatively about trends in higher education and take the leadership to help the library stay in the forefront. All outcomes assessment work is about students. Your actions today, tomorrow, and every day matter to them. These next steps are worth taking—they will bring satisfaction, alignment, and firm up the library’s centrality to the academic enterprise. I hope you will take the energy of this conference, harness it and begin to take your first step, in whatever form that takes. Thank you for acting.

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Notes


3. Achieving the Dream information can be explored at: [http://achievingthedream.org/](http://achievingthedream.org/).
Using Bibliometrics to Demonstrate the Value of Library Journal Collections

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Abstract
The combination of shrinking library budgets and rising journal prices has placed increasing pressure on libraries to justify their journal subscription budgets. In response, we attempt to demonstrate the value of the National Oceanic and Atmospheric Administration (NOAA) Libraries’ journal subscription budgets by analyzing the cited references made by NOAA-affiliated authors in their journal articles published over the past five years (2009–2013). We find that NOAA authors made over 400,000 references during this time period, of which over 90,000 were from 2013. Approximately 25% of these references were to publications less than four years old, while another 25% were to publications 15 or more years old. Over 25% of these references were to articles published in 12 journals and approximately half of them were to articles in 60 journals. Journal co-citation analysis indicates differences in the journals most heavily referenced by authors in different scientific disciplines. These results not only provide input for library collection development decisions, but also help quantify the value of library journal subscriptions to NOAA authors.

Introduction
As scientific journal subscription prices rise at rates above the Consumer Price Index and the Higher Education Price Index, and as library subscription budgets mostly remain flat or increase more slowly than journal prices, academic and research libraries face increasing pressure from their institutions to justify their journal subscription budgets. At the same time, the rise of big data and analytics has resulted in renewed interest in evidence-based decision making on the part of institutional leaders. This interest means that anecdotal evidence of the value of library journal collections no longer carries the weight it once did, prompting libraries to provide quantitative evidence of value to support their claims.

As they have at many libraries, these trends have been manifest at the Central and Regional Libraries of the National Oceanic and Atmospheric Administration (NOAA), where the libraries have faced substantial cuts to their journal budgets over consecutive years. The purpose of this paper is to respond to these trends at NOAA by attempting to quantify the value of the NOAA libraries’ journal subscriptions to NOAA scientists by analyzing the references made by those scientists in their published research. Although journal subscription value can also be measured by analyzing usage statistics, such statistics were not available to us for the entire institution because different parts of the agency receive access to journals through different subscriptions. In addition, we wanted to capture a more involved form of engagement with library journal collections than download counts alone could give us. We wanted to measure the extent to which these journal collections were actually incorporated into NOAA scientists’ original research.

The NOAA libraries system consists of 28 partially to completely autonomous libraries located across the country. These libraries differ greatly in terms of size, reporting structures, and funding sources, ranging from unstaffed reading rooms containing a few hundred items for in-person use, to one- and two-person libraries of hundreds to thousands of items serving NOAA scientists at specific laboratories and science centers, to the NOAA Central Library, with 14 full-time staff and a collection of over 400,000 items. Whereas most of
these libraries only provide services to the specific NOAA laboratory or science center that provides their funding, the NOAA Central and Regional Libraries—located in Silver Spring, Miami, and Seattle—provide services to NOAA staff across the agency. The NOAA libraries are working with the newly established NOAA Library Advisory Committee to identify areas in which cooperation and coordination between the libraries would enhance access to, and development of, library collections and services. Demonstrating the value of library journal collections to the entire agency is one of those areas.

Our method of demonstrating that value through the analysis of intramural research citations is well established in the library and information science literature. Local referencing patterns have been used to inform library collection development since at least the early 1970s. Although much of this literature focuses on the references made by undergraduate and graduate students, and therefore is not directly relevant to a government agency like NOAA, a number of studies have been performed that analyze faculty publications on specific topics. McCain and Bobick (1981) and Davis (2002) analyzed references by faculty and students in biology, Tsay (1998) and Rethlefsen (2007) studied references in biomedicine and public health, Choinski (2007) analyzed references in pharmacy, Ortega (2008) analyzed references in chemistry, LaBonte (2005) analyzed references in nanoscience, and Stephens et al. (2013) analyzed references in aerospace engineering. Other authors analyzed cited references across multiple subject areas or across their entire institutions (Salisbury and Smith 2010, Currie and Monroe-Gulick 2013, Wilson and Tenopir 2008). Finally, Hoffmann and Doucette (2012) reviewed 34 cited reference analyses published from 2005 to 2010.

Despite the frequency with which these methods have been used, citation analyses of faculty publications from the Department of Atmospheric Sciences at Texas A&M University to identify the sources, formats, and ages of the publications referenced.

Finally, a few studies suggest that there are positive and significant correlations between local cited reference patterns and other measures of journal use. Blecic (1999) compared in-house use, circulation, and citation by faculty at the University of Illinois at Chicago’s Library of the Health Sciences and found positive and significant correlations between the measures, although the strength of the correlations, ranging from 0.591 to 0.776, were not particularly high. McDonald (2007) analyzed journals owned by the California Institute of Technology to compare local print use, online use, local publication counts, and local references and found that online use was a significant variable in predicting local cited reference patterns. Knowlton, Sales, and Merriman (2014) found that local citation and usage statistics are highly associated with faculty valuations for titles which faculty use frequently and value highly, but are not highly associated with titles which faculty use infrequently or rate as lower value. These studies suggest that local cited reference statistics can be used to identify titles of high value to local faculty.

Methods
References cited by NOAA-authored articles were retrieved from the Web of Science, Science Citation Index Expanded database (WoS) during March 2014. We used the following search string to identify articles by NOAA-affiliated authors published each year:

\[ AD=(\text{NOAA \ OR } \text{"nat\ ocean\ atmos\ adm*" \ OR } \text{"nat\ mar\ fish\ serv*" \ OR} \text{NMFS}) \ \text{AND \ PY=2009} \]

We specifically included the National Marine Fisheries Service (NMFS) in our search string because we know from prior experience of identifying publications by NOAA authors that authors affiliated with NMFS laboratories and offices are less likely to include NOAA in their stated affiliations than NOAA authors affiliated with other branches of the agency. Although our search string does not retrieve publications by NOAA authors who listed their NOAA laboratory or division but did not include any reference to NOAA or NMFS in their stated affiliation, we feel that,
given the large number of articles and references the string did retrieve, it is unlikely that excluding such publications has significantly affected our results. In addition, the more restrictive search string has the advantage of increasing the precision of the articles retrieved, meaning that our analyses are unlikely to be affected by false matches.

We then added the results of each search to our “Marked List,” selected the Authors, ISSN, Title, Cited References, Times Cited, Accession Number, and Source fields for export, and exported all of the records to “Other File Formats.” We then copied the resulting files into a single text file for each year and then saved it as an .isi file for later import into the Science of Science Tool (Sci2 Team 2009).

To analyze the cited references by year and by journal, we converted the text file for a single year into a new .csv file and opened the .csv file with Excel, which parsed the cited references into columns for further analysis. We discarded all of the columns except the year and journal, sorted the references by publication year, and discarded the extraneous rows as well as a small number of incorrectly formatted references.

We then performed some rudimentary data cleaning on the titles of referenced journals to increase the accuracy of our final counts. We standardized variant forms of the journal title *Eos, Transactions of the American Geophysical Union*, since this standardization is not performed automatically by WoS. We also modified the cited references to two journals that have changed titles, so that all references to these journals refer to their current titles. That is, we changed references to the *Journal of Applied Meteorology* into references to the journal’s current title, the *Journal of Applied Meteorology and Climatology*, and changed references to *Estuaries* to become references to *Estuaries and Coasts*. References to single journals that have subsequently split into multiple parts, such as the *Journal of Geophysical Research* and *Deep-Sea Research*, were allowed to stand as referenced, since it was impossible to assign these citations to a specific part of the current journal.

Finally, we used various functions in Excel to calculate the number and percentage of references per year and per journal. We then repeated this process for each additional year.

Next, we created journal co-citation networks for each of the five years in our analysis. Journal co-citation networks are an elaboration of document co-citation networks in which nodes represent journals and edges, or connections between nodes, represent journal co-citations. In such networks, journals are connected if at least one current article referenced previous articles published in both journals in the same current article. Although journal co-citation networks have been frequently used to map the intellectual structure of scientific research in general or within certain disciplines, and used to identify journals for collection development, we are not aware of such networks having been created to map the intellectual structure of a specific institution.

To create a journal co-citation network for a single year, we loaded the original .isi file for that year into Sci2, which converted it into a .csv file, opened the new .csv file, and copied the “Cited References” column into a new Excel file. We then parsed the cited references using the “Text to Columns” feature in Excel, removed all of the citation information except the journal name, and saved the file as a .csv. We then opened the .csv file in Notepad++, replaced all of the commas (,) with pipes (|), removed the excess pipes, and then saved the file as a .csv.

We then loaded the new .csv file into Science of Science Tool (Sci2 Team 2009) and created a co-occurrence network on the modified “Cited References” column, using a custom function file to count the number of articles that cited each journal. Once the network had been created, we removed edges, or journal co-citations, with a weight of less than 500 to focus the network on the strongest co-citation relations between journals, extracted only the largest connected component of the network, and visualized the resulting network using Gephi. We then repeated this process for the remaining years.

**Results and Discussion**

We identified 8,737 articles published by NOAA-affiliated authors from 2009 to 2013. These articles made a total of 402,126 cited references, which form the basis of our analysis. Figure 1 shows the total number of articles, cited references, and average number of cited references per article per year in our document set. Both the total number of articles published per year and the number of
cited references per year increased substantially during this time period, with the number of articles increasing from 1,532 in 2009 to 1,981 in 2013 (a 29% increase) and the number of references increasing from 66,753 in 2009 to 94,244 in 2013 (a 41% increase). The average number of references per paper, however, grew at a more modest pace, increasing from 43.57 in 2009 to 47.53 in 2013 (a 9% increase).

Figure 1: Total numbers of articles, references, and references per article per year for NOAA-authored articles from 2008 to 2013.

These figures demonstrate that access to substantial numbers of scientific publications is necessary for NOAA authors to produce new articles. Our analysis suggests that access to between 40 and 50 publications is necessary for an author to produce a single new article. Our results also suggest that NOAA authors required access to over 90,000 publications in 2013 alone to produce nearly 2,000 original articles. Of course, it is likely that some of these references are duplicates, since some NOAA authors undoubtedly published multiple articles during this time period that cite the same prior publications. Despite this, however, our results do indicate that NOAA authors require access to tens of thousands of publications every year to produce their original research. Since NOAA requires its employees to publish as proof of their scientific activity, our results suggest that NOAA thereby requires access to scientific information to support the production of these articles. Furthermore, since our results indicate the number of publications, number of cited references, and references per publication have all increased over the past five years, it is logical to conclude that this need has grown over time, and it seems likely that it will continue to grow in the near future.

Next, we analyzed the age of publications referenced by NOAA authors. Figure 2 plots the percentage of cited references in each year by the age of the publication referenced at the time the reference was made. That is, approximately 7% of the cited references made in 2013 were to articles 1 year old. The plotted curves are remarkably consistent over the 5 years analyzed, with references to publications peaking at 2–3 years after their original publication date, decaying at a relatively linear rate between years.
4 and 15, and gradually flattening out after year 20. Figure 3 shows the cumulative distribution of all cited references by approximate quartile. The distribution shows that the citation half-life of NOAA cited references is approximately 8 years, with 50% of the cited references being to publications 0 to 7 years old, 25% to publications 8–15 years old, and so on. This half-life is normal for publications in the NOAA-related disciplines, since the 2012 edition of Journal Citation Reports gives citation half-lives of between 7.7 years for Meteorology and Atmospheric Sciences and 9.4 years for Oceanography.

Figure 2: Percentage of cited references in each year per year of age of the publication referenced.
The emphasis on recent publications in these referencing patterns—references peak after two years and nearly a quarter of all references are to publications less than four years old—is not surprising. Nearly 50 years ago, de Solla Price (1965) found that the majority of references from current papers are to other relatively recent papers, so this aspect of NOAA authors’ referencing behavior is to be expected. However, it does have two important implications for the NOAA library’s journal collections. First, it suggests that NOAA authors are not simply citing the same publications for years at a time, but rather are actively gathering, reading, and incorporating new scientific findings into their own research. Second, it implies that NOAA authors require ongoing access to current scientific publications to support their work, underlying the importance of maintaining current journal subscriptions.

Perhaps more surprising in these referencing patterns is the relative importance of older publications in addition to the emphasis on current publications. Nearly a quarter of all the cited references in our analysis, or over 90,000 cited references over these five years, are to publications 16 or more years old. Nearly 1% of the cited references in each year are to publications that were 25 years old when they were referenced. Since NOAA authors made around 90,000 cited references in 2013, this 1% value means that, last year, NOAA authors made nearly 900 references to publications from 1988. Taken together, these findings suggest that NOAA authors not only require access to the latest scientific publications, but also need continuing access to those publications for decades. In short, NOAA authors require access to both current and historical content to support their current work.

Next, we analyzed the journals referenced by NOAA authors. Figure 4 plots the cumulative percentage of cited references per journal for the most frequently referenced journals in each year. Even more than with the distributions of references per year, the distribution curves per journal are remarkably consistent across years. It is interesting to note that 15% of the over 400,000 cited references in our analysis were to articles published in just 5 journals, while 25% of the references were to 10 journals, and 50% of the references were to 60 journals.
Figure 4: Cumulative percentage of cited references per journal for the 75 most frequently referenced journals per year.

These distributions are consistent with those predicted by Bradford’s law of scattering, which suggests that the vast majority of the references in any publication set are to a relatively small number of “core” journals, and the remaining references are more widely dispersed among a larger number of peripheral journals. This suggests that the NOAA Central Library can provide for the majority of the references made by NOAA authors with a relatively small collection of core journals. A collection of just 60 journals would provide for 50% of the cited reference made during 2009–2013, and a collection of 200 journals would provide for 66% of all cited references during this time period.

This analysis also provides evidence for the necessity of maintaining access to these core journals. Each of the 20 most referenced journals represents at least 1% of the total references made during this time period, so the cancellation of any one of these journals would have a substantial impact on NOAA authors. On the other hand, this analysis also identifies those journals whose cancellation would not substantially affect NOAA authors. In both cases, however, this analysis can be used to justify collection development decisions made by the NOAA Central Library. It can substantiate the continuation of highly expensive journals like Nature on the basis of frequent references by NOAA authors to articles published in those journals and help defend the cancellation of other journals that are not as frequently referenced by the entire agency.

We next analyzed the number of references per journal per year to determine if the individual journals that make up this core in one year remained the same in subsequent years. That is, we attempted to determine if the journals that make up this core are fixed, or if they change from year to year. Figure 5 charts the number of cited references per journal per year for the 50 most frequently referenced journals in 2013. We focused on journals frequently referenced in 2013 both to see if journals that are currently important to NOAA authors were also important in previous years, and to identify journals that may have gained importance over this time period.
Figure 5 suggests that, for the most part, those journals most frequently referenced in 2013 were also frequently referenced in all of the previous years in our analysis. Although some journals changed position from year to year, the 12 most frequently cited journals in 2013 were also the 12 most frequently cited journals in each of the previous years. We list these journals in Table 1.

The remainder of the journals shown in Figure 5 remained highly referenced from year to year, although the yearly variability in reference counts increased as the total number of references decreased, suggesting that this second tier of journals is more susceptible to fluctuations in research focus by NOAA authors.

Table 1: The most frequently referenced journals by NOAA authors from 2009 to 2013.

<table>
<thead>
<tr>
<th>Journal</th>
<th>References</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal of Geophysical Research – Atmospheres</td>
<td>19,128</td>
<td>4.76</td>
</tr>
<tr>
<td>Geophysical Research Letters</td>
<td>13,383</td>
<td>3.33</td>
</tr>
<tr>
<td>Journal of Climate</td>
<td>12,339</td>
<td>3.07</td>
</tr>
<tr>
<td>Monthly Weather Review</td>
<td>9,679</td>
<td>2.41</td>
</tr>
<tr>
<td>Journal of the Atmospheric Sciences</td>
<td>8,121</td>
<td>2.02</td>
</tr>
<tr>
<td>Science</td>
<td>7,988</td>
<td>1.99</td>
</tr>
<tr>
<td>Atmospheric Chemistry and Physics</td>
<td>7,738</td>
<td>1.92</td>
</tr>
<tr>
<td>Marine Ecology Progress Series</td>
<td>6,968</td>
<td>1.73</td>
</tr>
<tr>
<td>Canadian Journal of Fisheries and Aquatic Sciences</td>
<td>5,981</td>
<td>1.49</td>
</tr>
<tr>
<td>Bulletin of the American Meteorological Society</td>
<td>5,732</td>
<td>1.43</td>
</tr>
<tr>
<td>Nature</td>
<td>5,732</td>
<td>1.43</td>
</tr>
<tr>
<td>Journal of Geophysical Research – Oceans</td>
<td>5,547</td>
<td>1.38</td>
</tr>
</tbody>
</table>
Despite this relative stability, the number of references to two journals in particular increased by over 500% over this time period. These journals are *Nature Geoscience* and *Plos One*. References to *Nature Geoscience* increased from 45 references in 2009 to 312 references in 2013, a 593% increase. Since the first issue of *Nature Geoscience* was published in January 2008, it is perhaps unsurprising that references to the journal would increase as increasing numbers of articles were published in the journal, but it is interesting to note the speed at which this new journal established itself as a major source of information for NOAA authors. References to *Plos One*, on the other hand, increased 1,729% over this time period, from 24 references in 2009 to 439 references in 2013. The reasons for this remarkable increase are not clear. Certainly the total number of articles published in *Plos One* increased dramatically during this time period—from over 4,000 articles in 2009 to over 31,000 articles in 2013—so, as with *Nature Geoscience*, the increasing availability of articles to reference may have driven some of this change. But mere increases in the number of articles published in both journals cannot entirely explain the increases in NOAA references, because articles published in the journals had to be brought to the attention of NOAA authors, be sufficiently relevant to their work, and be of sufficient quality for them to be referenced. Additional research seems necessary to fully understand the reasons for these increases.

Smaller increases in the number of references to other journals may signal shifts in the research focus of NOAA authors. Increases in the number of references to journals such as *Climatic Change* (a 214% increase), *Global Change Biology* (a 113% increase), and *Climate Dynamics* (a 150% increase) over this time period may signal a shift toward research on climate change and its effects on terrestrial and marine ecosystems. Other notable increases were to journals such as *Atmospheric Chemistry and Physics* (a 115% increase), *IEEE Transactions on Geoscience and Remote Sensing* (a 112% increase), *Fisheries Research* (a 101% increase), and the *Journal of Hydrometeorology* (a 106% increase). All of these journals, however, remained among the most highly referenced journals by NOAA authors over the entire time period analyzed.

Taken together, these analyses suggest that there is a set of 12 core journals for NOAA authors that remained constant throughout this time period and were consistently referenced more often than any other journals in our analysis. Beneath this core set of journals were a large number of more peripheral journals whose identify and number of references were more fluid, although the magnitude of references to each journal remained relatively constant over the five years. Nevertheless, increases in references to certain journals suggest that the identity of the journals in the core is not firmly fixed and that journals that were peripheral in the past may become core in the future.

Finally, we created journal co-citation networks for each of the five years in our analysis to determine whether these core journals were referenced by all NOAA authors, or if there were differences in what journals were considered to be core by different NOAA authors. A visualization of the network derived from articles published in 2013 is given in Figure 6.
As with the distributions of references per year and journal, the overall structure of the network remained fairly constant over the five years, with journals related to weather, climate, and the atmospheric sciences clustered on the left, and journals related to marine biology and ecology clustered on the right. These two clusters of journals are connected by interdisciplinary and oceanography journals, although the interdisciplinary journals tend to be more frequently referenced in combination with the atmospheric science journals than with the marine biology journals. Within the atmospheric sciences cluster, there also seems to be loose divide between basic journals covering the physical composition and processes of the atmosphere and applied journals dealing with weather and climate. A similar divide seems to occur in the marine biology cluster between basic journals on marine biology and ecology and applied journals on fisheries and fishery policy. Finally, there seems to be relatively few connections between these two clusters of journals—that is, few NOAA articles reference both marine biology and atmospheric science journals—suggesting that NOAA authors tend to work along disciplinary lines.

It is interesting to note that not only are there more journals in the atmospheric sciences cluster than in the marine biology cluster, but these journals also seem to be referenced by more NOAA articles than the marine biology journals. Further analysis would be necessary to determine the cause(s) of this imbalance, but two potential explanations might be that NOAA authors produce more articles on atmospheric sciences than on marine biology, or that NOAA authors writing on the atmospheric sciences.
This analysis suggests that there are different core journals for different communities of NOAA authors. The central journals for atmospheric science authors include four American Meteorology Society journals (*Journal of Climate, Monthly Weather Review, Bulletin of the American Meteorological Society, and Journal of the Atmospheric Sciences*) and three American Geophysical Union journals (*Geophysical Research Letters, Journal of Geophysical Research—Atmospheres, and Journal of Geophysical Research—Oceans*). The central journals for marine biology authors, on the other hand, are *Canadian Journal of Fisheries and Aquatic Sciences* and *Marine Ecology Progress Series*. Only a few journals like *Nature* and *Science* are referenced by both communities of authors. As a result, although the NOAA Central Library can provide for the majority of NOAA authors’ references with a small collection of core journals, the Library ought to balance that collection between author communities publishing in different disciplines to ensure that the needs of each of these communities is adequately met.

**Conclusion**

Our analysis of the references cited by NOAA-affiliated authors in their articles published between 2009 and 2013 produced a number of potentially useful results. We found that NOAA authors require access to tens of thousands of scientific publications every year to produce their original research. Although the majority of these publications were published during the past eight years, NOAA authors required access to substantial numbers of older publications as well. A small number of core journals published the majority of the publications referenced by NOAA authors and, for the most part, these core journals remained highly referenced throughout the years in our analysis. However, we found substantial differences in the journals referenced by authors from different disciplines, with relatively few journals referenced by authors across the agency.

In interpreting these results, however, it is important to note that NOAA employs a large number of scientists, observers, and policy-makers who do not produce scientific publications, but who nevertheless require access to scientific publications to perform their duties. Such employees include weather and climate forecasters, fisheries managers, environmental impact assessors, coastal resource planners, and more. In particular, employees of the National Marine Fisheries Service write fisheries regulations and environmental impact assessments which often require access to hundreds to thousands of publications as supporting evidence for their policies. Such uses are not reflected in our analyses. This means that our results are, in some cases, underestimates of the actual use of scientific publications by NOAA employees. But it also means that our results represent a potentially biased sample of NOAA employees’ use, since it only reflects the usage patterns of NOAA authors. Our results, then, should be interpreted with caution and used in combination with usage data to make collection development decisions for the NOAA libraries.

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**Notes**


References


Science of Science (Sci2) Tool. Indiana University and SciTech Strategies.


Measuring Impact: Tools for Analysing and Benchmarking Usage

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The Journal Usage Statistics Portal (JUSP) and Institutional Repository Usage Statistics (IRUS-UK) are services developed in response to the requirements of academic libraries in the UK. These services enable librarians and repository managers to exploit usage data in order to gain insight into use of their collections, inform decisions, enable development of policies, and assess and demonstrate value and impact. JUSP aims to provide a single point of access to journal usage data for UK higher education libraries and research councils. The service utilises machine-to-machine processes (the SUSHI protocol) to deliver economies of scale and offer huge cost and time saving efficiencies for libraries nationally. IRUS-UK, on the other hand, consolidates and compares COUNTER-compliant usage statistics to demonstrate the value and impact of institutional repositories and enable benchmarking at a national, and potentially an international level. The session provides an overview of these services and highlights their value and benefits to institutions. Recent qualitative research conducted with users of these services in the UK provided some valuable feedback and this is outlined during the session through a series of use cases. Research highlights the benefits of using JUSP and IRUS to offer time efficiencies, help librarians investigate and analyse journal usage, establish value for money to help in purchasing and renewal decisions and demonstrate value and impact of their institutional repositories. Through specific use cases the session will describe how these services contribute to greater institutional efficiency and cost-effectiveness. This presentation is particularly relevant to the following conference themes: information resources, collections and e-metrics; management information; performance measurement and measures; value and impact. The presentation describes how these services are being used to assess value and demonstrate impact in a period of financial constraint and a changing academic landscape. It emphasises the value of community collaboration and support to deliver a responsive service that effectively meets the needs of its users. The session also highlights the key challenges and opportunities emerging from this work in the UK and internationally. Implications of the research for the wider library and information community are discussed.

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Undertaking research and sharing it with colleagues around the world is now happening electronically in a fraction of the time it used to take in a strictly print environment. While dissemination of content has increased rapidly, methods for usage assessment have not advanced at the same pace. Most bibliographic assessment today is still conducted using citation analysis, generally at a journal level, despite the variety of new metrics based on electronic data capture and interactions with content. The transition to digital content distribution is also opening up a range of new opportunities for assessment of the impact of content, and it is time that the community begins to build upon these “alternative” metrics—often called altmetrics. To effectively use these new altmetrics, we need to have a common core of standardized definitions and methodology across the industry.

To address these issues, the National Information Standards Organization (NISO) has undertaken a project to assess the community needs for assessment metrics, identify potential projects to advance the development and use of the new metrics, and then develop consensus standards and/or best practices to address those needs.

NISO has a long history in the development of library- and publishing-related standards, having served the community for more than 75 years. NISO is a nonprofit association, accredited as a US Standards Development Organization by the American National Standards Institute (ANSI). NISO’s mission is to develop and maintain technical standards and best practices related to information, documentation, discovery, and distribution for published materials and media. NISO is a volunteer driven organization with more than 400 regular contributors spread out across the world participating in its work. The scope of NISO’s work is very broad and covers a wide variety of higher education, industry, and trade activities touching on nearly every aspect of library resource and content management. Many of the standards that most information professionals use on a day-to-day basis—such as ISBN (International Standard Book Number), ISSN (International Standard Serial Number), DOI (Digital Object Identifier), Dublin Core metadata, DAISY digital talking books, OpenURL, and MARC records—are core components of NISO’s standards portfolio.

Standards form the basis of a great deal of the infrastructure upon which we rely on a daily basis. This is as true for information distribution as it is for the automotive, plumbing, and electrical infrastructure. While standards might be obvious for plumbing or electrical systems, they are not as noticeable to users of information products. And the infrastructure elements of alternative assessments are particularly unclear to many not directly involved with these measurements. The key elements of an assessment infrastructure include a variety of both technical and intellectual standards. These include basic definitions, a common understanding about what is being measured and how those measures are scoped and counted, and an understanding of the timescale against which assessment materials are monitored and compared. For alternative metrics to function properly, there needs to be a way to uniquely identify the various metadata elements of a piece of content, including the creator (using ORCID or ISNI), the institution (using an ISNI institutional identifier), the funder of the research (using the FundRef registry), the content object itself (using a DOI, ARK, or URI), and the parent publication (using an ISBN, ISSN, ISRC, or other content object identifier). These persistent unique identifiers provide a clear opportunity for linking, entity extraction, and aggregation of source data.

The scope of new forms of assessment is quite broad and encompasses a tremendous range of potential metrics of impact against which scholarship can be gauged. These metrics range from determining levels of use, such as download
counts, to actions to save a document in a citation manager or other research tool, to engagements with content, such as sharing it with a colleague. Beyond citation in traditional journal literature, there are other newer types of references to content, such as in mass media, legislative action, social media, or even books, which have been woefully neglected by citation metrics. Use can also be measured well beyond citation, such as in adoption or application of a described approach. Other forms of less obvious use, such as network behavioral tracking or in discovery, might also have value. In addition, advances are being made and tested regarding sentiment analysis—algorithmically determining the overall tenor of a commentary—that go beyond simply the value of someone referencing something in the literature.

Many scholars are creating scholarly outputs that do not fit easily into traditional journal publication or citation models. For example, many researchers create software, datasets, patents, conference presentations, or multimedia. These nontraditional outputs have not been recognized in scholarly research evaluation because they exist outside of traditional journal publishing and also lack a tradition of citation. These outputs present significant challenges to traditional metrics and have yet to develop their own methodologies for capturing use or impact.

New metrics also need to be evaluated in the context of granularity and aggregation. Traditional metrics, such as the Journal Impact Factor or COUNTER-based usage statistics, measure activity at a journal level. While this may be valuable in assessing the relative value of a publication as a whole, it is less valuable in determining the impact of a particular article, a particular researcher’s portfolio, or a department’s productivity. Traditional metrics are well suited to measure activity at the traditional level of aggregation—the journal publication—but they are less effective for disambiguating impact at a more granular level. In a digital environment, data collection can easily take place at the individual article or item level—or at an even more granular level, such as figures or tables, if objects are uniquely identified. Other types of identifiers, such as the ISNI for institutions, ORCIDs for researchers, or FundRef for funding bodies, will allow aggregation to be done in a variety of ways beyond the journal package.

Another variable to consider, which needs consideration during a consensus approach, is the length of time coverage for assessments. Measuring citations from the prior two-year publication period is generally viewed as a reasonable guide for counting active citations, however there is significant variation among different fields in the relevance of this timeframe. The citing half-life element of the impact factor—which is defined as the median age of the articles that were cited by the articles published in the journal that year—is a frequently misunderstood element in the Thomson Journal Citation Reports. Even less understood are the citation aging patterns of non-journal literature. For example, how long are blogs actively cited and does this differ across domains? What is the appropriate time scale for social media, for data sharing, or software use? As there is not yet any formal practice in place for these activities, it is likely too soon to set definitive benchmarks, but there is enough potential activity to draw some preliminary conclusions upon which theories can be tested.

In the end, the goal is to create metrics and assessment practices that are both valid and reliable. If the academy is going to rely on these new metrics for tenure, promotion, or project funding, they must be both trustworthy and understandable. This requires that the data be auditable, and possibly publicly available, or at a minimum, exchangeable within a closed system. How the data are gathered, processed, and calculated must be standardized to produce comparable figures and build trust for these measures in the community. In the same way that COUNTER developed a common understanding and methodology of how online download activity should be calculated in the early 2000s, the community needs to foster common practices to foster trust in the newer metrics.

Building on its prior assessment activities, NISO began working with the communities interested in both article-level metrics and the newer forms of social media and network analysis. During the Altmetrics meeting in Evanston, IL, held in conjunction with the NetSci 2012 conference hosted by the Association for Computing Machinery, Todd Carpenter participated in a self-organized discussion session on the topic of standards for altmetrics. The conversation was wide ranging and included a significant number of the overall conference participants.
During that open forum, many potential areas of standardization were discussed, as well as whether such standards were even needed, and whether it was too early to develop them. It was decided at that meeting that further organized conversations needed to take place on this topic. NISO sought and subsequently received support in the fall of 2013 from the Alfred P. Sloan Foundation for a two-phase project to explore the need for altmetric standards, potential areas of standardization, prioritization of work, and consensus development of the prioritized needs for standards or best practices.

The first task of that grant-funded initiative was to draw together a diverse set of stakeholders and thought leaders as a steering committee. Some of that group helped draft the proposal and commented on early drafts of the project’s scope. Additional members were added after the project was approved and launched. That group assisted in identifying participants, preparing talking points and discussion topics, as well as setting the agenda for several in-person meetings. They also assisted in recruiting participants to the in-person meetings. NISO hosted three in-person discussion sessions to gather input from the community in the initial brainstorming phase. The first was held in October 2013 in San Francisco prior to a meeting on article level metrics arranged by PLOS. The second was hosted in Washington, DC in conjunction with the Coalition for Network Information fall meeting, and the final in-person brainstorming meeting was held in Philadelphia prior to the American Library Association Midwinter meeting. In addition, a series of 30 one-on-one telephone interviews was conducted to gather input from underrepresented groups in the three face-to-face meetings. In particular, participation from administrators, representatives from funding bodies, and researchers was sought via the interviews.

The three meetings followed a similar agenda pattern. Each began with a brief introduction to the topic from Todd Carpenter. There was then a round of five to ten minute “lightning talks,” during which various participants spoke about ongoing work at their own organization or community related to new assessment metrics. The entire group then undertook an idea gathering exercise that involved posting ideas or discussion topics. These ideas were then grouped into emerging themes. The entire group of participants voted on the topics of interest, then broke out into self-organized discussion groups to spend about an hour discussing among themselves specific problems, activities, research, or questions they had regarding their chosen theme. Each group then reported out to all the participants about their ideas. This process was repeated two or three times depending on the session and a final discussion among all the participants rounded out the day. In addition to the participants in the room, all three of the meetings were live-streamed, insofar as was possible, to a broader virtual community where several dozen additional people participated in the conversation. Each of the meetings was recorded and posted to the NISO website along with all of the meeting notes and outputs.

Examples of the lightning talks given during the in-person meetings included:

- The expectations of researchers
- Exploring disciplinary differences in the use of social media in scholarly communication
- Altmetrics as part of the services of a large university library system
- Deriving altmetrics from annotation activity
- Altmetrics for institutional repositories
- Snowball metrics: Global standards for institutional benchmarking
- Use of the International Standard Name Identifier (ISNI) in metrics
- Altmetric.com, Plum Analytics, and a Mendeley reader survey
- Twitter Inconsistency

Slide presentations from the lightning talks are also available on the NISO website.

The topics discussed during the three in-person meetings varied considerably from session to session. During the first meeting in San Francisco, there was a group that focused on business and use cases. This discussion centered on publishers’ business motivations, the values of authors, and the end users of metrics. Another group focused on data quality and data science issues related to context, data validity, provenance, metadata, and data source quality. A final group focused on definition issues, such as the differences in meaning of commonly-used terminology.

During the Washington, DC meeting there was a much broader group of researchers, librarians, and systems providers in attendance. The themes that
came out of that meeting included a discussion of business and use cases from a different stakeholder perspective, qualitative versus quantitative metrics, the use of metrics in discovery and discovery services, and the identification of stakeholders and their interests. Again, the topic of definitions came up, but more from the perspective of defining impact than from the perspective of specific types of metrics. Finally, one breakout group focused on the need to develop tools and approaches that are “future-proof,” in that they will address longer-term needs and be adaptable to changes in approaches and data streams over time.

At the final meeting in Philadelphia, the topic of definitions was raised again, but this time specifically around lifecycles of research and where metrics might be valuable. Additionally, the topic of qualitative and quantitative aspects was discussed. The differences between scholarly and popular science uses were considered in light of their different types of use, i.e., social, commercial, scholarly or legislative. Data integrity and reproducibility were also considered very valuable paths to explore and the topic of use cases was discussed again.

During the telephone interviews, additional ideas and perspectives were added to the growing pool of issues NISO could pursue. While less organized than the outputs from the in-person meetings, a lot of valuable data was gathered. Among the key insights gleaned from these discussions were the significant perception problems with the term “altmetrics” and the lack of clear definitions for these new forms of assessment. Several interviewees noted the use cases of discovery, social engagement, and assessment as each being very distinct and likely needing unique approaches. Several respondents emphasized the project should be as broadly inclusive as possible of the types of scholarly outputs that should be included. Consistency in methodologies to calculate the metrics was mentioned as essential. Similarly, the problems of item-level identification and data tracking were considered critical to an improved assessment ecosystem.

Over the past two years, several suppliers of metrics based on the concept of altmetrics have developed services around these nontraditional assessment approaches. These providers have seen significant interest and support from the community. However, several small studies have shown that there is significant inconsistency about how such data is collected and reported, due to the lack of any standardization in this area. While this is a typical growing pain of any new methodology, it is one that must be addressed and quickly, as no community will come to rely on metrics that vary so widely from vendor to vendor or are not replicable.

Drawing together all of these different data points, the leadership of NISO, along with the Alternative Assessment Metrics Steering Committee identified eight major themes from the more than 200 different ideas that the meetings and interviews generated. A white paper outlining in detail each of these themes and the specific project ideas was released to the community in June 2014, about 9 months after the brainstorming efforts were begun. Below is a list of the eight summary themes along with some of the 24 project ideas that were grouped under each theme.

- **Definitions**—Establish common definitions for what is meant by different types of alternative assessment.
- **Application to types of research outputs**—Begin by identifying the research output types, such as software, datasets, or performances that are applicable to the use of alternative metrics. Then define relationships between these different research outputs and develop metrics for this aggregated model.
- **Discovery implications**—Metrics can have use cases other than assessment. Explore the use cases and issues surrounding the use of altmetrics in discovery.
- **Research evaluation**—What is the role of alternative assessment metrics in research evaluation? Identity specific scenarios (e.g., research data, social impact).
- **Data quality and gaming**—Focus research on the question of reproducibility. Develop strategies for improving data quality. Assess strategies to prevent “gaming” of the metrics.
- **Grouping, aggregating, and granularity**—Explore the ways in which data can be gathered, grouped and aggregated. Identify at what level data should be identified and gathered. Support the use of persistent identifiers to assist in these efforts.
- **Context**—Describe the use cases for each community or domain and explain where there are significant differences in the applicable types and methodologies for assessment metrics.
Adoption and promotion—Focus on building awareness of the new assessment approaches and help to build trust in and adoption of those metrics.

The release of the white paper concluded Phase 1 of the NISO project. Phase 2 began shortly following the release of the white paper and included publicizing the effort and its outcomes, along with soliciting feedback and input on which standardization efforts NISO should pursue. Several presentations of the output were made at industry events throughout the spring, summer, and into the fall. Public comments were solicited on the white paper. In addition, a survey was released to the public in an effort to rank the project ideas. The NISO Business Information Topic Committee, tasked with recommending which of the initiatives NISO should attempt to advance, also received input from the members of the initiative’s steering committee. All of these prioritization efforts were expected to help provide guidance to the NISO leadership committee and to support the outreach to NISO’s members who are the ultimate determiners of which efforts NISO undertakes.

Subsequent to this presentation given at the 2014 assessment conference, the NISO Business Information Topic Committee recommended to the NISO membership that work be advanced in five specific areas:
1. Develop specific definitions for alternative assessment metrics.
2. Promote and facilitate use of persistent identifiers in scholarly communications.
3. Develop strategies to improve data quality through normalization of source data across providers.
4. Identify research output types that are applicable to the use of metrics.
5. Define appropriate metrics and calculation methodologies for specific output types, such as software, datasets, or performances.

Work is expected to begin on these initiatives in January 2015 and continue through June of 2016. NISO member and nonmember participation in the working groups is encouraged, though preferential appointment to NISO working groups is provided to NISO member organizations. More information about the projects and regular updates will be provided to the community as the effort moves forward.

It is critical for the community to focus attention on the development and adoption of standards and best practices related to these new forms of assessment metrics. Without them, the adoption of new metrics will be hampered by confusion about what is being counted and how, by inconsistency in data gathering and reporting, and ultimately by lack of trust by end users in the data and metrics the community is trying to supply. There is a great deal of potential in these new assessment tools to provide quicker feedback, more diverse data on scholarly impact, and support for a much broader set of scholarly communications types than currently exists using strictly journal-based citation metrics. While it is too early to say definitively which metrics will prove most useful or in what context they will be most applicable, we must first begin by ensuring the data upon which we are assessing those metrics are comparable, accurate, and verifiable. Standards and best practices can lay that groundwork.

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Acknowledgement
NISO would like to thank the Alfred P. Sloan Foundation for the generous support provided in support of this initiative. In addition, the tireless contributions of the volunteer members of the Steering Committee and the NISO Business Information Topic Committee is also recognized and appreciated

Endnotes


8. ORCID, http://orcid.org/.


Who’s Asking What? Modelling a Large Reference Interaction Dataset

Andrew Asher
Indiana University Bloomington, USA

Like many library systems, the Indiana University Bloomington (IUB) Libraries have observed a steady decline in reference questions over the past several years. Between 2006 and 2013, the overall number of reference transactions decreased 31%, or an average of about 4.8% per year.¹ In order to investigate this decline, I assembled a dataset of all reference transactions recorded in IUB’s online tracking system, in which librarians have recorded all reference, directional, and equipment questions asked at all service points across the IUB Libraries since 2006, as well as questions sent directly to subject and area studies librarians (see Figure 1). From 2006–2013, 774,660 questions were recorded in this system, including 457,794 reference questions (Figure 2).

Figure 1: Key to library abbreviations used in this paper.

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Library Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-ARCHIVES</td>
<td>Indiana University Archives</td>
</tr>
<tr>
<td>B-BCC</td>
<td>Neal-Marshall Black Culture Center Library</td>
</tr>
<tr>
<td>B-BUSSPEA</td>
<td>Business &amp; School of Public &amp; Environmental Affairs Library</td>
</tr>
<tr>
<td>B-CHEM</td>
<td>Chemistry Library</td>
</tr>
<tr>
<td>B-EDUC</td>
<td>Education Library</td>
</tr>
<tr>
<td>B-FINEARTS</td>
<td>Fine Arts Library</td>
</tr>
<tr>
<td>B-GEOLOGY</td>
<td>Geosciences Library</td>
</tr>
<tr>
<td>B-GEOMAP</td>
<td>Geography &amp; Maps Library (now closed)</td>
</tr>
<tr>
<td>B-HPER</td>
<td>Public Health Library</td>
</tr>
<tr>
<td>B-JOURNALISM</td>
<td>Journalism Library (now closed)</td>
</tr>
<tr>
<td>B-LIFESCI</td>
<td>Life Sciences Library</td>
</tr>
<tr>
<td>B-LILLY</td>
<td>Lilly Library (Special Collections)</td>
</tr>
<tr>
<td>B-MUSIC</td>
<td>William &amp; Gayle Cook Music Library</td>
</tr>
<tr>
<td>B-OPTOMTRY</td>
<td>Optometry Library</td>
</tr>
<tr>
<td>B-SLIS</td>
<td>Library &amp; Information Sciences Library (now closed)</td>
</tr>
<tr>
<td>B-SWAIN</td>
<td>Swain Hall Library</td>
</tr>
<tr>
<td>B-WELLS</td>
<td>Herman B Wells Library</td>
</tr>
<tr>
<td>Subject/Area Studies</td>
<td>Subject &amp; Area Studies Librarians</td>
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</tbody>
</table>
Reference Questions in Aggregate
Public service points at IUB’s main research library, Herman B. Wells, account for roughly half of all of IUB Libraries’ reference transactions. The Wells Library has also experienced the most precipitous decline in reference demand, logging 36,527 questions in 2006 compared to 20,430 in 2013, or a decrease of 44%. The remaining branch libraries and subject/area studies librarians logged 24,696 reference questions in 2006 and 21,730 in 2013: a much smaller decrease of 12%. This downward trend was observed across most of the IUB branch libraries, with the exception only of the University Archives, the Business Library, the Life Sciences Library, and the Music Library. Reference questions answered by subject and area studies librarians also showed a relatively stable trend over the entire dataset, but have dropped significantly in the last two years (Figure 3). In absolute numbers, this represents an average overall loss of 2723 reference questions per year since 2006.
These data seem to suggest that library users are, in general, making less use of public service desks across the IUB campus, but especially in the main research collections (B-WELLS).

Nevertheless, in-person walk-ups to the libraries’ service points continue to be the most common way to ask reference questions, even though the proportion of in-person questions has declined from 72% in 2006 to 58% in 2013. Chat/IM is the next most common contact method at 16.3% in 2013, followed by e-mail at 15.7%. Both e-mail and chat/IM contacts have risen dramatically since 2006, from 5.5% and 1% respectively. Not surprisingly, telephone contacts have decreased significantly: from 21.7% in 2006 to 9.2% in 2013 (Figure 4).
In terms of service point usage, IUB reference desks tend to be busiest in the late morning to early afternoon early in the week, with 2–3 pm on Tuesdays as the busiest single hour over the six-year period studied. Questions tend to taper off by the 6 p.m. hour every day, and the number of daily questions declines from its peak on Tuesdays to a low on Saturdays before gradually increasing on Sunday and rapidly increasing on Monday (Figure 5). These rhythms of the academic workday and workweek are likely familiar to many ARL librarians.

**Figure 5: Overall reference questions asked at IUB Libraries by hour, 2006–2013.**

<table>
<thead>
<tr>
<th>Reference Question Content</th>
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<tr>
<td>To learn more about the content of these reference questions, I conducted a word frequency analysis of the 2.1 million words contained in the 178,467 logged reference transactions that included the full text of the question asked. Within this corpus, resources and statements of need were the most commonly occurring words. Book was the most used word, and book/books appeared a total of 45,620 times, or 2.1% of the total word count. Article/articles (0.6%), information (0.3%), and journal (0.2%) also ranked highly. The occurrence of these terms also remained relatively stable over time (Figure 6). In total, questions involving books accounted for 26.2% of the questions, while articles and journals accounted for 11.4% (Figure 7).</td>
</tr>
</tbody>
</table>
Within this corpus, the most commonly occurring verbs were indicative of user needs: help (1.0% of the total word count), looking (0.8%), need (0.6%), access (0.3%) and finding (0.2%) (Figure 8). These verbs also co-occurred in reference questions mentioning books, journals, and articles at high frequencies, with “find” ranking first in co-occurrences for all three resource types (Figure 9).
Taken together, these results suggest, perhaps unsurprisingly, that reference questions directed to service desks are primarily focused on getting assistance finding and accessing particular resources or information. Nevertheless, while just under 40% of reference questions appear to be concerned with information needs associated with locating books and journal articles, the remaining 60% exhibited no clear pattern.

**Reference Question Difficulty**

As a strategy for understanding the difficulty of reference questions, I randomly selected .005% of the logged questions as a representative sample from the reference tracking system. Three librarians (myself and two subject librarians) then rated these questions using the Reference Effort Assessment Data (READ) scale, a 6-point rubric designed to measure the effort required to answer reference questions. More difficult questions that require more effort for a librarian to answer receive a higher score. Nine hundred and one questions were rated, with a mean score of 2.3 and a standard deviation of 0.817, indicating that most of the questions in our dataset were relatively straightforward to answer and very few were difficult research questions (Figure 10).
Figure 9: Co-occurring words in reference questions by resource type mentioned.
When comparing the scores by contact type (Figure 11) and year (Figure 12), I found relatively little variation in the means, and while this variation was statistically significant using one-way ANOVA, the effect size was very small. Interestingly, questions received at the University Archives were scored as more difficult than at other libraries (ANOVA: F=32.156, p<.01, $\eta^2 = .035$), although the effect size was again small (Figure 13). The distribution of the scores of questions received at the Wells Library was not statistically different than at other IUB libraries. These results suggest that the difficulty of reference questions is similar across all of the IUB Libraries and has remained stable over time and contact method.
Figure 11: Mean READ Scale scores by contact type.
Conclusions and Future Research

Although the overall volume of reference questions at IUB Libraries has declined fairly dramatically since 2006, this analysis suggests that there has been very little change in the content or difficulty of questions associated with this decrease in reference demand. Moreover, while the method of contact with reference librarians appears to be shifting away from in-person to online methods, this also does not appear to affect the difficulty of the questions asked. Because so few variations were observed in the difficulty of the questions, it seems likely that much of the decline in reference demand since 2006 is a result of more sophisticated and better designed online research tools enabling library users to answer many of their questions without contacting a librarian.

While the logged questions analyzed in this study provide great breadth to understanding the patterns of reference questions at the IUB Libraries, one of these data’s limitations is that they only include brief librarian-written summaries of the questions asked rather than the question in the library user’s own words. In order to provide more detail for understanding the library user’s point of
view, I also attempted to construct a topic model
for more than 16,000 e-mail transcripts archived
from IUB Libraries’ reference e-mail account from
2007–2013. Unfortunately, the texts of these
e-mail inquiries proved too short to construct a
meaningful model. A future content analysis of a
representative sample of these e-mail texts, as well
as the over 30,000 online chat transcripts collected
by IUB Libraries since 2009 may be undertaken to
further investigate these aspects of library users’
reference needs and experiences.

—Copyright 2015 Andrew Asher

Notes
1. In absolute numbers, IUB librarians logged
61,223 reference questions in 2006, compared
to 42,160 in 2013.
A Mixed-Methods Approach to Questionnaire Development: Understanding Students’ Interpretations of Library Survey Questions

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ABSTRACT
Ever wonder if students will really understand what you mean by specific words, phrases, or entire questions that you want to use in your library survey? We report on a study conducted in two phases in which both qualitative and quantitative methods were used to assess the validity and reliability of questions for a new Ithaka S+R student survey launched at UNC Chapel Hill and at numerous other college and universities in 2014. In January (Phase 1), UNC staff pre-tested the survey instrument on undergraduate and graduate students using cognitive interviews, which is an iterative process for qualitatively assessing the validity of survey questions using think-aloud and verbal probing methods. Cognitive interviewing is also a practical approach that is suitable for library organizations and can be used more widely for pre-testing one-on-one interview questions, focus group questions, and other forms of communication related to assessment. Based on the findings of the cognitive interviews, we constructed and refined close-ended survey questions, including a series of attitudinal items regarding the role of library services and support. In March (Phase 2), Ithaka S+R staff analyzed the UNC Chapel Hill survey results for the attitudinal items using factor analysis, which is an exploratory model for quantitatively assessing the validity and reliability of psychometric constructs. We explore how the discoveries that we made from both phases revealed latent problems with question drafts and illuminated already known difficulties, ultimately leading to a better survey design. In providing qualitative and quantitative evaluations of survey questions, we demonstrate that a mixed-methods approach provides a better understanding of how students’ interpretations of library-specific terms and phrases correspond with how they self-report library-related attitudes. We conclude by offering special considerations and tips we learned along the way, such as authoring Institutional Review Board proposals for cognitive interviews, planning for successful cognitive interviews, and designing effective questions and probes.

Purpose
The purpose of implementing a survey as an assessment tool is to gain insights into users’ attitudes, behaviors, and knowledge in order to better serve their needs. It is thus critical for survey results to be methodologically valid. Questions and questionnaires are considered to be valid when compelling evidence, including both qualitative and quantitative types of data, are gathered according to best practices in survey research methodology and are used to demonstrate that survey items measure what they are “designed or intended to measure.”

During the pre-testing and pilot testing phases of a newly designed survey, there are two different types of validity that should be considered. First, qualitative pre-testing on the survey instrument should be conducted in order to establish that respondents think about and interpret questions in the same manner. Second, a pilot study should be conducted, and quantitatively analyzed, in order to demonstrate that survey items are accurate operationalizations of the variables you aim to assess with the questionnaire. In this paper, we report selected findings from both the qualitative and quantitative testing phases of the Ithaka S+R Student Survey conducted at UNC Chapel Hill with undergraduate students, but the procedures and methodology can be followed for those interested in evaluating other existing surveys or developing new
surveys, such as institution-specific homegrown questionnaires.

**Methodology: Cognitive Interviewing**

Cognitive interviewing is a qualitative method for testing questions that may be problematic. It is an iterative process that uses think-aloud exercises and verbal probing. Cognitive interviewing can be used to reveal latent problems and improve upon known problems, leading to the better design of questions for surveys, interviews, focus groups, and polls, as well as instructions for study participants. While it may be common to informally check-in with colleagues or student staff about a survey draft, the cognitive interviewing process takes it a step further by providing a structure and a methodology that is tested and proven to help improve questionnaires.

The cognitive interviewing method has been used to develop many national surveys, such as by the Bureau of Labor Statistics’ *Time Use Survey.* In addition to the BLS, several other agencies have created in-house labs to facilitate cognitive interviewing, such as the Census Bureau and the CDC’s National Center for Health Statistics. A review of the literature within the field of library assessment yielded little evidence of the use of cognitive interviewing as a tool for survey design. However, this method is used widely in other fields that make heavy use of survey research, such as sociology and education. Just one example of cognitive interviewing used as a method for improving a library-related questionnaire design was found. The hybrid method of both cognitive interviewing and pre-testing survey questions was used by Staley, Branch, and Lewitt of San Jose State University, and is the method we followed in designing this study. Staley, et al. discusses their use of the cognitive interviewing and think-aloud method in pre-testing the survey questions they drafted in order to evaluate student learning during discipline-based library instruction sessions. Their aim was to produce a standardized survey tool consisting of pre- and post-test questions that could be used for “locally-relevant” information literacy assessment.

Gordon B. Willis is a leading authority on the cognitive interviewing method as a tool for survey development and his publication *Cognitive interviewing: a tool for improving questionnaire design* is the most comprehensive guide to the theory and practical application of the method for this purpose. The cognitive interviewing method can be broken down into a few basic steps:

1. Identify potentially problematic questions in your questionnaire draft.
2. Develop probing questions for each questionnaire question that you want to test.
3. Write a script for interviewers.
4. Recruit participants and schedule interviews.
5. Conduct the cognitive interviews.
6. Analyze responses.
7. Revise questionnaire questions.
8. Re-test your revised questionnaire questions.

Willis created seven categories of question types for cognitive interviews:

1. **Instructions**—These are the types of questions that you might ask in order to make certain that your instructions are clear (e.g., “In your own words, tell me what you think these instructions are telling you to do.”)
2. **Clarity of question wording**—These cognitive interview questions help determine if the wording of the question makes sense to the survey taker. These questions can help test for lengthy, wordy, or ungrammatical wording; technical terms or jargon that a participant may not understand, and will help identify vague questions. There are also examples of cognitive interview questions that can help you identify if the definition of time periods are accurate, missing, or in conflict with the intention of the survey (e.g., “What time period did that question cover?”)
3. **Assumptions**—These questions help test whether or not the survey you designed made inappropriate assumptions about the participants and their context. (e.g., “In what way did this question apply to you? Or did it apply to you?”)
4. **Knowledge and memory**—These questions can help you check whether or not participants might have trouble remembering something they need to in order to answer a question in your survey. Questions in this category can also help identify if participants are missing the knowledge or experience necessary to answer the question.
5. **Sensitivity and bias**—If you are designing a survey for staff regarding workplace climate, for instance, it would be a good idea to ask questions that allow you to gauge sensitivity around the wording of more sensitive
questions. During our cognitive interview process for the student survey, we got feedback from students about the choices they were presented in the demographic section of the draft regarding their race or ethnicity. Survey questions related to more personal information can be tested with questions like “This question uses the word ( )... Does that sound okay to you or would you choose a different word?” or “Is this okay to talk about in a survey or is it too uncomfortable?”

6. **Response categories**—These are questions that allow you to determine if the range of responses that you have provided in a survey are adequate. For instance, you can test for open-ended questions that are too difficult to answer, identify mismatches between question and response category, or overlapping or missing response categories. An example we used in our study was “How easy or hard was it to find your answer on that list?”

7. **Other problems**—(e.g., “Can you tell me more about that?”)

A classic example of cognitive interviewing in action is described by Willis in his guide on the subject. He describes his experience with a study of children’s problem solving behavior. In that study, Willis and his colleagues asked the children the following question aloud during one-on-one interviews:

“The poodle has 9 puppies. The collie has 5 puppies. How many more puppies does the poodle have?”

To their surprise, several students gave the same incorrect answer, which was “none” or “zero.” Through asking a series of probing questions about their answer to the puppy math question, Willis discovered that some students were being asked if the poodle had more puppies, not how many more she had than the collie. Once this was clarified, they were able to rewrite the question so that all students understood the meaning of the question.

When planning cognitive interviews, you have the choice of conducting interviews as participants are taking the survey, or after the survey has been completed. We decided to conduct the interviews after the surveys were completed because we did not want to indirectly bias how participants answered the survey questions. By interviewing them after they took the survey, we could also pre-test the time it took to complete the survey uninterrupted.

Using templates of cognitive interview questions and prompts from Willis’ book, we developed an interview protocol for a draft survey tool that was to be used in the Ithaka S+R Student Survey Pilot during the spring of 2014. Before proceeding with our study, our protocol was submitted to UNC’s Institutional Review Board and was considered “exempt” from full review. Participants signed consent forms before participating in the study.

Cognitive Interviews Study: The Pretest

When we embarked on the pretest, Ithaka S+R had already conducted the survey at one other institution. Based on the results of that study, Ithaka staff created two versions of the undergraduate survey and two versions of the graduate student survey that we pre-tested with the cognitive interviewing process. A pretest of the cognitive interview instrument was conducted with a small group of four undergraduates and two undergraduate students. We discovered several logistical glitches and question wording issues that could be easily resolved, before launching into the full-fledged cognitive interview study. First, we realized that participants required additional prompts to certain questions in the study. Since we asked students to take the survey before participating in the cognitive interview, we were also able to time how long it took them to complete the survey. We were able to answer our own questions about which versions of questions to use between the two survey instruments for each (undergraduate and graduate), settling on just one survey instrument for the full cognitive interview study. We timed the first round of cognitive interviews and weeded out cognitive interview questions to reduce the time of the interview sessions. Even with the smaller cohort of students in this first round, we were able to identify questions we could exclude from the full study.

Having gone through a pretest we felt confident in our decision to not record interviews, but to simply take notes during the cognitive interview process. The time constraints we were working under and the limited staffing available to conduct the study prohibited us from recording and transcribing the interviews, however, close note taking was sufficient. It helped that both the assessment librarian and our graduate assistant working on
the project had experience transcribing interviews and were able to type their notes and quotes from participants fairly quickly.

The Full Cognitive Interview Study
We conducted cognitive interviews with a total of twenty UNC Chapel Hill students, including ten undergraduate students, five master’s degree students, and five PhD students. Since the questions and instructions for each survey differed (due to the population groups being studied), two separate cognitive interview worksheets were required (one for undergraduates and another for graduate students). Interviewers typed their notes directly into the cognitive interview worksheet. We numbered each question on the worksheet and included the survey number as well to help us navigate the responses later.

We presented $10 Amazon.com gift cards as incentives for participation in the study. An e-mail was sent to all UNC Chapel Hill subject librarians and other library staff asking them to circulate an invitation to participate in the study. This helped us recruit a diverse group of student participants from across campus and we reached our goal in terms of numbers of students. In order to get accurate results, it is important to recruit participants in cognitive interview studies that align with the profile of your anticipated participants for the final version of your survey.

At the beginning of each cognitive interview session, the interviewer used the following script, which had been prepared ahead of time, to introduce each participant to the study:

Thank you for agreeing to participate in this study. This interview will take under one hour. I’m going to ask you to first take the survey that we’re testing and answer the questions as you would normally. Once you have finished taking the survey, I will ask you a series of questions about the survey. This whole procedure will take under an hour. It may be difficult to articulate your thinking process, but please know that there are no wrong answers. We are just interested in understanding how students are interpreting the survey questions. Once we’ve completed the interview, I’ll give you a $10 Amazon gift card to thank you for your participation. If you need to leave for any reason during the next hour, please let me know. Do you have any questions before we start?

As with any study involving the interview process, we found it was important to stay true to the scripted material already prepared. It may be very tempting for library staff involved in interviews to interrupt the flow of a study in order to educate participants about library services and to give them tips on their research behavior. This should be avoided at all costs, as it can lengthen the time to complete the study and make participants in the study feel they are being “corrected.” This can lead to participants trusting the interviewer less and, as a result, biasing participants’ responses.

Students were given time to take the full questionnaire online in Qualtrics, in the same way students would eventually take it when the survey was released on campus later in the semester. The interviewer printed out the participant’s responses to the survey, in order to see responses in an aggregate and at-a-glance. Prompts for some questions were designed to be modified based on the response given in the survey (e.g., “I see you answered ‘neither agree nor disagree’ to this question. Can you tell me why you answered the way you did?”). Most of the cognitive interviews were completed under an hour.

Here are three examples of cognitive interview questions that we used in order to test the Ithaka S+R Student Survey:

We asked you to think about your most recently completed research paper or project. When did you complete that paper or project?

How did you decide to answer this question the way you did? Was there a particular experience or experiences that you reflected upon before while answering the question?

What time period were you thinking of when we asked you how often you collaborate with one or more faculty members?

The following are examples of draft survey question wording, the cognitive interview question we asked,
along with select responses from students and the changes we made to the original survey question:

**Example A**

**Original survey question wording:** In the courses you are currently taking, how often do you use each of the following types of sources of information in your assignments or coursework?

**CI question:** “What did you think we meant when we said ‘historical documents’?”

**Selected undergraduate student responses:**

- “I wasn’t sure about that. I thought maybe speeches people had given or old laws, I do little with history so that threw me for a loop.”
- “I thought it was referring to a facsimile or copy of a historical document. A really old historic news article or something that was super noteworthy. I’m not a 100% sure. I’ve not taken a history class in four years.”
- “I think of the Declaration of Independence and Anne Frank’s diary.”
- “Anything that’s fact and really old, at least way out of my generation. I don’t use anything super old so I don’t...I didn’t think much of it. If it isn’t recent to me, it’s something historical I guess.”

**New survey question wording:**

“Collection(s) of historical documents or records (such as rare books, hand-written letters or diaries, artifacts, etc.)”

**Example B**

**Original survey wording:**

“The library has an archive that I use for my coursework or research.”

**CI Question:**

We weren’t sure that they would understand the term ‘archive’ used in this context, so we asked the following C.I. question: “What did you think we meant by ‘an archive’?”

**Selected undergraduate student responses:**

- “I was just thinking that there’s a sector of nursing coursework, an online database where I can look for nursing related things. I’m not sure if an archive is physical or virtual.”
- “I thought of the reserve reading books. I’m sure there is an actual archive of historical docs or art pieces the typical definition. Things set aside to a certain collection.”
- “I thought of the reserve reading books. I’m sure there is an actual archive of historical docs or art pieces the typical definition. Things set aside to a certain collection.”

**New survey question wording:**

“The library stores, organizes, and keeps track of books, articles, data, images, or other resources.”
Example C

Original survey wording:
“Librarians or library staff provide assistance or guidance about coursework or research at any time of day or night (24/7).”

C.I. Question:
“How did you decide to answer this question the way you did?”

Selected undergraduate student responses:
“I think it’s unreasonable for the people working the desk at 4 a.m. to be able to know about their coursework. I don’t think there should be a “reference” librarian 24/7. It’s a little unrealistic.”

“...no one starts their research paper at 2 a.m. with a librarian.”

“I thought about when I use librarians or library staff and I decided I would never use them during the night. I think it is unfair to ask that from librarians or library staff.”

“It wasn’t important 24/7 but throughout the day to have library staff available to talk to if you find yourself completely lost...”

New survey question wording:
We did not change the wording of this question.

Cognitive Interviewing: Tips
1. Pre-test your cognitive interview instrument and refine it early on. We found it immensely useful to pretest the cognitive interview instrument and refine it before launching into a full-fledged study, because we were able to resolve problems ahead of time that saved us time and trouble in the full study.
2. Write a script for interviewers. This saved us time and reduced variation in delivering instructions between two different interviewers.
3. Be selective. Cognitive interviewing takes time, so only test those questions in the full study that you think are truly likely to be problematic.
4. Pace yourself. Just like with any kind of interviewing process, do not over-schedule your interviewers or they (and your results) will suffer at the hands of fatigue. We had two interviewers who conducted twenty interviews over the span of twelve days. Our rule was not to conduct more than two interviews in a row, and no more than three or four interviews in a day per interviewer.
5. Take the time to analyze your results. We were pressed for time, so the three of us analyzed the results on our own and then had a group meeting to hash out next steps. Ideally, given enough time, it would have been useful to draft summaries of question responses.
6. Refine and re-test questions. This may be necessary for some, but not all, survey questions. In most cases, you can glean from the interviews what wording will work. You might use your judgment here and only test those revised questions that still seem like they might be problematic.

Quantitative Phase of Questionnaire Development: Factor Analysis
One of the primary goals of a survey, as opposed to other assessment methods such as in-depth interviews or focus groups, is to quantitatively measure latent or underlying constructs, which are variables that are not directly measurable through observation or by other means. One classic example of underlying constructs are “math” and “vocabulary” abilities or subject-specific ability as measured by standardized tests such as the SAT, LSAT for verbal reasoning, GRE, ACT, etc. For example, if a set of questions is designed to measure calculus ability, we would expect respondents to vary in their responses to a range of easier and more difficult calculus problems, depending on each respondents’ calculus ability level. However, if the calculus problems are worded
in ways that are convoluted or use vocabulary that is too advanced for the target population of test-takers, the questions could also be, or could primarily be, assessing respondents’ reading or vocabulary ability. This is why it is critical to pre-test questions using a method such as cognitive interviews in order to establish expectations and hypotheses about whether questions are designed effectively to measure what they are intended to measure and are not measuring reading comprehension ability or subject-specific vocabulary skills.

Following a pilot study, researchers and practitioners use quantitative (statistical) models to discover the interrelationships between underlying constructs and variables that are directly measurable or observable (e.g., responses to survey questions), which allows for a measurement of the underlying construct or constructs by proxy. Certain statistical models, such as exploratory factor analysis, may provide empirical evidence regarding the number of underlying constructs that are measured by a set of newly developed or adapted survey questions. Exploratory factor analysis is a procedure to simplify a large number of variables (e.g., survey questions) into a smaller set of underlying constructs (the conceptual equivalent of common denominators).

It is important to note that factor analysis can determine how many independent variables, or factors, cause a set of dependent variables (operationalized as survey questions), but the analysis cannot identify or label those variables. When using exploratory factor analysis, researchers and practitioners must attempt to identify what the question items for each factor have in common with each other, and then attempt to figure out what underlying independent variables or constructs explain each set of factors.

**Tip:** Assessment librarians, researchers, or practitioners without a quantitative background can potentially recruit a methodologist from an institutional research office, a social science or data science liaison librarian, or applied statistics or social science grad students with quantitative training in econometrics or psychometrics to conduct this and other types of survey data analyses.

**UNC Chapel Hill Pilot Study: Methodology**

The UNC Chapel Hill implementation of the Ithaka S+R Pilot Undergraduate Student Survey was launched on February 17, 2014, and was closed to new responses on March 3, 2014, with a total of 1,792 complete responses. All 17,279 full-time and part-time UNC Chapel Hill undergraduate students received an e-mail invitation to participate in a survey about student research habits. Three e-mail reminders were sent before the close of the survey. An incentive was offered in the form of a chance to win one of twenty-five $10 Amazon gift cards. In total, 2,513 respondents clicked the survey link (about 15% of those who received the e-mail invitation), with 2,284 of those starting the survey (13%), and 1,792 of those respondents completing the survey, for an overall response rate of about 10%.

**Results of the Pilot Study: Correlation Matrix and Factor Analysis**

The survey included many questions covering a range of topics and themes, but in this paper we focus on one set of questions as illustrative of the quantitative approach to validating items following a qualitative pre-test. In this section, we report results of correlations and an exploratory factor analysis, conducted using the Stata statistical and data analysis software package, for a set of six items addressing different facets of support or services that may be offered by librarians or library staff.

We hypothesized in the development phase of this questionnaire that a respondent who believes that librarian-provided service in one domain or in one area is useful would be expected to feel similarly about the other kinds of services that are or could be provided by librarians. Theoretically, the way respondents’ answer one of these questions should relate to their responses to other similar questions. This hypothesis was informed by previous work that identified an “affect of service” construct regarding librarian-provided support. Questions that are designed to measure the similar constructs as other surveys, regardless of whether they are actually worded similarly to questions in other surveys, should replicate results of similar surveys or studies in terms of the number of underlying constructs that are identified via correlations and structural equation modeling. In this case, we did not design the set of questions on librarian-provided support to measure the “affect of service” construct, but we did design these questions to
measure a potentially complementary, and most likely related, construct of perceived “utility of service” of librarian-provided support.

Before conducting a factor analysis, a correlation matrix should be constructed and analyzed.

**Correlation Matrix of Librarian-Provided Support Services Questions**

<table>
<thead>
<tr>
<th>Librarians or library staff provide assistance or guidance about coursework or research at any time of day or night (24/7)</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Librarians or library staff go into classrooms and teach about how to find sources for course-specific research papers or projects</td>
<td>0.48</td>
</tr>
<tr>
<td>Librarians or library staff provide assistance or guidance with tools used to mine or manipulate digital information</td>
<td>0.51</td>
</tr>
<tr>
<td>Librarians or library staff provide assistance or guidance with managing data or datasets that I use for my coursework or research</td>
<td>0.47</td>
</tr>
<tr>
<td>Librarians or library staff provide help for learning about technology, digital, or online tools that I need for my coursework or research</td>
<td>0.50</td>
</tr>
<tr>
<td>Librarians or library staff provide support in learning and using online search engines, databases, or tools</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Correlation coefficients denote the relationship between two variables, and can range from -1 to 1. The closer a correlation coefficient is to 0, the less two items are related to each other. A common practice is to retain items that have coefficients above 0.30.
Note: Original question: “How useful is it to you personally that your campus library provides each of the services listed below? Or, if one or more services are not currently provided, please tell us how useful it would be to you personally if your campus library provided the service(s).” Response option anchors are coded as follows: Extremely Useful (5); Very Useful (4); Somewhat Useful (3); Not too Useful (2); Not Useful at All (1). Pearson correlation is used to determine the relationship between two variables. Pearson coefficients for all correlations included in this table are functionally equivalent to Spearman rank-order correlations. N = 1,735 and p < 0.001 for all correlations.

This matrix shows that the librarian-provided support items are all moderately to strongly correlated—with one potential exception. The 24/7 item is not as strongly related to the other items, although it would not be considered weakly correlated. Something else may be contributing to cause “noise” in the results, but this stood out in the correlation matrix because we were aware of the potential problem with the wording of this question as ascertained from the cognitive interviews.

We conducted a factor analysis to quantitatively assess the structure of these items and to establish evidence that the items measure a single underlying construct.

### Undergraduate Student Exploratory Factor Analysis

| Librarians or library staff go into classrooms and teach about how to find sources for course-specific research papers or projects | 0.7681 |
| Librarians or library staff provide assistance or guidance with tools used to mine or manipulate digital information | 0.8721 |
| Librarians or library staff provide assistance or guidance with managing data or datasets that I use for my coursework or research | 0.8404 |
| Librarians or library staff provide help for learning about technology, digital, or online tools that I need for my coursework or research | 0.8876 |
| Librarians or library staff provide support in learning and using online search engines, databases, or tools | 0.8547 |


The table of factor coefficients shows one factor is retained with strong loadings (0.60–0.95) explaining a large percentage of the variance of the items. When interpreting this table, a factor coefficient is equivalent to a regression coefficient in a model where each survey question is a dependent variable and the factor or underlying construct is an independent variable. In other words, the higher the factor coefficient of a survey question (i.e., the closer to 1), the more important that survey question is in explaining the underlying construct. Thus, we may interpret the results of this factor analysis to indicate that responses to these questions have one main underlying cause, which we label as: level of perceived utility of librarian-provided support and services. The single factor solution indicates that the wording of the questions is not interfering with what the questions are designed to measure.

However, we also conducted a reliability test on the items as a group, which is a widely used post-hoc
technique for further contextualizing the results of the factor analysis. Reliability or internal consistency tests provide estimates of the extent to which we can replicate the results of this factor analysis (either on UNC Chapel Hill undergraduate students or with different populations of undergraduate and/or graduate students). In this case, this means that we would expect two students with the same level of perceived utility of librarian-provided support should report the same scores to this set of six questions. In other words, a reliability test helps to establish evidence in support of the generalizability of the findings of the factor analysis.

The most commonly reported measure of internal consistency or reliability is Cronbach’s alpha. A higher alpha coefficient (i.e., above 0.80 or 0.90) indicates higher internal consistency. An item-by-item analysis revealed that the 24/7 question increases measurement error enough to affect the reliability of these sets of items together. The Cronbach’s alpha for the five items (i.e., not including the 24/7 question) is 0.90, which is a very strong result. At this point, we have two options. First, we could drop the 24/7 question from the survey. Second, we could reword the question to remove the confounding element in an attempt to construct an item that is closer in conceptual consistency with the other items in terms of a facet of the underlying construct (i.e., remove the “24/7” availability component), and then retest the question. Since we believe general availability is an important facet of this construct, we opted to reword and retest this question.

Practical Value
Testing for validity at all stages of the questionnaire design process is necessary, but is not sufficient, in bolstering the kinds of legitimate claims you can make about your survey findings and in ensuring that interpretations are not hindered by ambiguity. All elements of survey questions include measurement properties. This means that to be able to properly analyze survey data quantitatively, you must be certain that respondents are interpreting every part of a question in the same way, or the question itself becomes a confounding factor. In this paper, we provided a step-by-step overview of conducting cognitive interviews to improve the design of survey questions, and we demonstrated how the typical quantitative approaches to analyzing survey data are strengthened by qualitative pre-testing. We thus encourage library assessment researchers and practitioners to consider a mixed-methods approach in evaluating survey questions, as this “best practice” approach in survey research methodology allows for a better understanding of how students interpret library-specific terms, including potential jargon, which also has implications for the kinds of practical interpretations that can be made from quantitative data analyses of survey results.

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Notes

2. Ithaka S+R is a is a strategic consulting and research service that focuses on the transformation of scholarship, teaching, and learning in an online environment, with the goal of identifying the critical issues facing our community. Ithaka S+R has fielded a national survey of faculty members triennially since 2000, and is expanding the surveys program to examine the needs of the other key user community: students. Although the pilot testing phase included six institutions as participants, and also included graduate and professional students, in this paper we report only on the undergraduate survey results from UNC Chapel Hill.


7. Ibid.

8. Students who participated in the full cognitive interview study were majoring in computer science, biology, math, psychology/biology, health behavior, studio art, nursing, journalism, business/Japanese, philosophy, city and regional planning, and information and library science. A couple of students who participated were undecided.

9. Some people like to have participants take a paper survey as part of a cognitive interview, because erasures, crossing-out of answers, or other markings could provide additional clues to the interviewer. We decided there were more benefits to conducting the survey online, including the ability to conduct at-a-glance analysis of answers.


13. The maximum sample size is 17,161 students, after taking consideration of undeliverable e-mails.

14. Other statistical software, such as SPSS, R, or SAS, can also be used to conduct these analyses.


Using Photovoice to Explore Native American Students’ Perceptions of the Physical Library

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Abstract
This qualitative multi-case study using photovoice focuses on Native American students’ perceptions of one academic library and its role in his or her life. Limited research focuses on Native American students in academic libraries, particularly the role the library might play in students’ persistence toward graduation. Exploring how individual students who identify as Native American perceive the university library may offer added understanding of how libraries in Primary White Institutions (PWIs) can best serve students and support their academic persistence. Photovoice, a form of visual research and a participatory research method, is the method chosen to explore students’ perceptions of the library. This paper presents emergent findings from this ongoing study, which began in 2013.

Introduction
The Edmon Low Library is located at the heart of Oklahoma State University (OSU), a land-grant, Research I institution. A modified Georgian brick building graced by a fountain and sweeping library lawn, the library is a campus icon. This six-floor building, which opened in 1953, has a public seating count of 1,800. The main entrance opens to a marble lobby and grand staircase. The first floor includes service and checkout desks, current periodicals, the largest computer cluster on campus, numerous printers, group study rooms, and a coffee shop. The other five floors house varied resources: books, group tables and individual study carrels, gallery space, soft and hard furniture, a computer training room, and the Math Learning Success Center.

In fall 2013 the OSU headcount was 20,493 students, with 1,394 self-identifying as American Indian/Alaskan Native and 9 students self-identifying as Native Hawaiian/Pacific Islander. The diversity of the student body is steadily increasing, but the campus is a Predominantly White University (PWI). The university continues to rank high nationally on degrees conferred on Native American students. However, as administrators have noted at other institutions, successful retention of the majority of Native American students toward graduation both within PWIs and in Tribal Colleges remains an unrealized institutional goal. At OSU, the first-year retention rate and six-year graduation rate of full-time freshmen Native students, as well as other racial/ethnic groups, still lags behind those of white students.

Oklahoma has the second highest state population of American Indian/Alaskan Native people alone-or-in-combination. Nine percent of the population in Oklahoma identifies as American Indian/Alaskan Native, and Oklahoma has 38 federally recognized tribes. Nationally, Native Americans struggle with high rates of poverty, unemployment, high school attrition, as well as postsecondary degree completion. A congressional mandated study of underrepresented racial/ethnic groups in higher education found that the bachelor’s degree completion rate within six years is, at 14.4%, lowest for American Indian/Alaskan Natives.

Problem Statement
Nationwide, federal and institutional entities have developed programs such as TRIO, GEAR UP, and College Horizons to serve, advance, and retain Native American and other underrepresented students, but the library’s potential to serve students of color is unclear. Oakleaf’s research review and report (2010) spurred library stakeholders’ efforts to demonstrate the value of libraries to their respective institution. Research into the library’s role in student retention, learning, experiences, and perceptions has increased since that time.

To explore the role libraries play in the lives of some Native American students, this qualitative study offers student voices and images through
the method of photovoice. This promising methodology can provide insights into student perceptions of libraries, because the participants are the primary agents in defining the parameters of the specific visual and verbal data they collect. In this study, students move through and use library space to collect data. Their reflections will help inform future research and practice. The research questions were:

- How do Native American students perceive the role of the academic library in her/his life?
- Through participants’ photovoice about the library, which elements of the library do students depict and describe as holding meaning for them?

**Photovoice**

Photovoice, a form of visual or image-based research and a participatory research method, is a creative method for exploring students’ perceptions of the library. Wang and Burris are credited with first articulating the concept of photovoice, which they defined as a “process by which people can identify, represent, and enhance their community through a specific photographic technique.” They delineated three goals for photovoice: helping participants document the “strengths and concerns” of their community through photographs, encouraging group discussion of community issues, and “reaching policymakers.”

Fundamental to this methodology is the primary role participants play as agents and instruments in the data collection process through deciding which photos to take, where they take them, and the meaning they create and share about those images. This sense of control and degree of artistic license are potentially empowering characteristics of photovoice.

While early photovoice studies were often based in community health or health education, researchers are increasingly adapting the technique to new questions, topics, and disciplines, and have developed general guides to the practice. Some studies have used photovoice to study Native Americans issues. In one case, researchers found the tool to be “effective and engaging” for undertaking Indigenous research focused on environmental and health issues in Canada, noting that photovoice tapped into Indigenous traditions of observation and storytelling, and offering implications for leadership, policy, and historical documentation. An obesity prevention photovoice study with Native American adolescents identified complex health concepts within participants’ lived environments.

Although photovoice is rare in library research, some scholars use it to study higher education. Our review discovered one library study utilizing photovoice, a longitudinal study focusing on information literacy skills and experiences of high school students as they move into postsecondary education. Higher education studies have used photovoice in advocating for campus policy, or as a pedagogical tool. Most studies found photovoice an effective method for insights into students’ lived experiences.
METHODOLOGY
This multi-case study of five Native American students uses photovoice as the primary mode of inquiry to explore the phenomenon of interest: perceptions of the academic library. The variety of evidence case studies employ for thoroughly exploring “how” or “why” questions is its strength as a research method. Case study focuses on the “particularity and complexity of a single case, coming to understand its activity within important circumstances.” In multi-case study, examining each individual case in detail contributes to understanding of the whole.

Furthermore, multi-cases are linked in some ways. The cases for this study are linked in at least two ways. First is that all participants self-identified as Native American who use the physical library at least three times a month. The second link is the student’s persistence toward graduation through active enrollment and completing at least three semesters of college. This is an important consideration of the student retention rate at OSU, because new students who leave the university tend to leave during or shortly after their freshman year. Having completed three semesters of study indicates that students are past the first major marker in attrition patterns and progressing toward degree completion.

PARTICIPANTS
Thus far, five students ranging in age from 19 to 23 have participated in this Institutional Review Board approved study: Amanda, Kellie, Megan, Sage, and Charlie [pseudonyms]. All potentially identifying information (e.g., hometown, tribal affiliation, etc.) were masked to protect identity. Megan and Sage’s interviews and “member checks” both occurred during their sophomore year; Charlie’s interview and “member check” occurred during his junior year; Amanda’s interview occurred her junior year and the “member check” occurred as she was preparing to graduate and applying to graduate schools; finally, Kellie participated during her senior year and the “member check” occurred after she graduated and as she was making plans for graduate school.

PROCEDURES
The coordinator of Native American affairs in the Office of Multicultural Affairs assisted with recruitment by posting fliers in her office and by forwarding e-mail invitations to members of the Native American Student Association (NASA). An incentive of ten dollars cash per hour of participant’s time was offered, an amount that was sufficiently modest to prevent coercion. The exchange of money or a gift card for participants’ time is an issue of reciprocity, described by Patton (2002) as providing something of value to participants in exchange for students’ providing their valuable perspectives to the researchers.

Two meetings with students occurred in the primary investigator’s (PI) office, and both meetings were recorded with an Olympus digital recorder. Meetings were set up for the students’ convenience and also at times when the library is typically less busy, to minimize intrusion of library users. After the PI met the students, the first phase consisted of reviewing and signing the consent form, completing a biographical intake sheet and short survey (see Appendix), and responding to three initial semi-structured interview questions:

1. How did you first learn about the library?
2. Describe any interactions you have had with library employees.
3. In what ways does the library make a difference for you?

The short survey and initial questions were designed to help students begin thinking about their library use and experiences. This information also provided key contextual information for the photographs. When students were uncertain about library resources or services, or asked questions, the PI jotted a note, “parking” the idea until the interview ended. At that point, she answered each question and even demonstrated online tools, or accompanied students to the library stacks to demonstrate how books are shelved.

In the second phase of the first meeting, the PI showed participants how to use the camera and reviewed the photo prompt:

Take a least fifteen different photos of the Edmon Low Library. Photos should represent some meaning for you. Meaning may be of things you use in the building or online, favorite things, things you dislike or like, things that are confusing or easy, or new things you discover. Photos can be of exterior or interior things. Photos cannot
show the faces of people.

The description focused on student-driven meaning and the prompts were merely suggestions. The primary researcher provided students with a Sony digital camera for the activity and reminded students that they would discuss each photo when they returned. When participants returned, the PI asked about their experience of taking photos, and images were uploaded and discussed one by one. Later, the PI made back-up copies, then removed the images from camera between participants to prevent others from seeing the photos, and also transcribed the interviews word-for-word for the second meeting, which consisted of member checking and photo ranking.

The second meeting with participants took place between one month and twelve months after the initial interview, focusing on three activities. First, the PI asked a series of clarification questions based on initial analysis of the first interview transcript. Second, the PI asked participants to discard one photograph and explain why, and, finally, she asked participants to rank the top photos and explain the reasons. These "member checks" were recorded and later transcribed word-for-word.

The study revealed several similarities. While the study criteria specified at least three visits to the library per month, all of the students indicated they come to the library one to three times a week. Similarly, they all use a variety of spaces and seating in the library, and they all actively participate in the Native American Student Association. Some of the ways the students’ cases are dissimilar are age, gender, major field of study, classification, and place of residence. Also, use of the library’s online resources varied in frequency—Sage and Kellie use the online resources one to three times a week; Amanda uses the online resources more than three times a week and Megan and Charlie described their use as more than three times a month.

**Data Analysis**

Both researchers analyzed the data in multiple ways and over time. Initial analytic insights were noted during the interview process, as well as through immersion in the transcription process. Photographs were categorized by topic and meaning using the participants’ own words, and evaluated for convergence and divergence, and substantive significance. All of the photographs were evaluated for comparison across the multi-cases.

**Discussion and Findings**

Visual sociologist Harper writes that participant photos are usually of two types: “images of mundane objects that are special because of their role in the lives being documented,” or “visualized metaphors, sentiments and emotions.” The interviewing process revealed the meanings that participants ascribe to objects and images in the photographs. Participants took the following number of photographs: Amanda, 17; Kellie, 17; Sage, 15; Megan, 17; and Charlie, 15, for a total of 84. Almost all of the photos were taken inside the building. Surprisingly, no one took an exterior photo of the entire iconic image of the library. Instead they took pictures of objects they use, like, or that help them, and that seemed at first glance to be “mundane” as Harper notes, such as printers, computers, signs, and elevators. All five participants took photographs of individual study carrels, and four photographed the vending machine. The highest number of sentiment photos was of things pertaining to Native culture: two photos of Native books, two photos of Native Americans in traditional attire, and two photos of the library’s Browsing Room because of the Native programming which has occurred there.

**Finding One—Declining Relevance of Books**

Although several students indicated their appreciation of books and reading, the data support the trend scholars and librarians have noted of the declining use of books in academic libraries. Out of 84 photos, only four were of books. Only Sage and Charlie had ever checked out a book from this library. Amanda, who has never checked out a book at OSU, said, “...all the rows and rows of books and I’ve always [wondered], ‘Oh there’s so many books’ but I never really use any of them, so I just kind of wonder if people use them!”

Megan, whose first photo was of books, expressed her investment in books and their clear association with the library. Yet her comments and questions related to her book photographs also highlighted her limited experience and understanding with how to utilize this library resource. She said,
... my instant thought was to take a picture about books because I really do like to read, but I know NOTHING about how to check out a book, where to find the books I would be interested in, what books are reference books, what books, you know, where I could find books for my major or anything.

**Figure 1: Row of Books**

Her second photograph of books underscored both the limited experience described above and the missed opportunities she realized through the photovoice activity:

...I had no idea. I guess I mean I would have known, if I would have thought about it, but I was just walking by a desk, [where] I was gonna [go] to take pictures... and there were ...tribal books [*voice rising with surprise*]... Ah, I mean it's a library so *clearly*, you know, when you think about it, you would think they would have like Native American books and stuff, but it had just never come to my mind, and I was like 'Wow! Maybe I would check some of those out,' if I would have been *aware*.

**Figure 2: Two Books**

Despite visiting campus between one and three times per week, and her affection for books, her awareness of the ways the library might serve her reading interests increased through the photovoice study, echoing Sage’s comment, “...I like to read a lot of books on Native American issues.” This finding is suggestive for considering ways libraries might better link students’ cultural interests with library resources.

**Finding Two—Valuable Role of Functional Library Tools**

The varied pictures of objects that outsiders might see as “mundane” were important to students because they facilitated their academic work.
All students referred to the key equipment they use—particularly computers and printers—and the majority of the pictures represented such objects as scanners, printers, and computers. For example, an interesting set of photographs represented common signs, such as a finding aid sign for electrical outlets. Kellie described her quest for these signs because they enable her to charge her laptop:

I find these signs to be golden...I always am aware of these signs and I turned the corner and I saw this and I knew this was a picture that needed to happen.

FIGURE 3: Sign

Similarly, in pointing to his picture of “the quick print station” Charlie said:

It’s on the first floor, and this is REALLY helpful because if I have an assignment due, or a paper or something like that, I'll just head to campus maybe a few minutes early and I'll go to one of these computers, get on my e-mail or the online classroom, and I'll just print off what I need for class, or assignments that are due and stuff like that.

FIGURE 4: Print Station

These pictures represent both the value of library resources to students because they aid in streamlining their academic work as well as, more broadly, the gradual shifting use of the library as information technology has developed. What was previously a repository of texts is now a multi-purpose space re-envisioned for the needs of contemporary students.

Finding Three—Photovoice as Library Discovery
Participants remarked on the novelty of the research methodology and seemed to enjoy the photo activity. Three participants said they had specific photos in mind after hearing the prompt, but two participants said, at first, their photo taking was random. Overall, participants seemed
to approach the photograph-taking process both in terms of representing/reflecting how they use and what they value in the library, as well as recording new things they discovered about the library through the process of photography. They were surprised at some of the objects they encountered through the camera lens that they had not noticed previously. Megan remarked,

...I found a lot of things. I would just walk by things and say [to self], “Oh, I’d never really noticed that.” When I was really looking for things, I started to realize a lot more that there is to the library.

This comment reflects a broader pattern in the photovoice method, that revisiting a familiar environment with heightened awareness and a different purpose can uncover, as Harper remarked, “previously unknown or unconsidered dimensions of social life.”47 For instance, Amanda was unaware of the iPads and the self-checkout station for books. Sage discovered the library’s exterior live webcam, and Charlie discovered the current periodicals section.

The initial survey/checklist also revealed students had different levels of awareness of library services. Only two participants were aware of the library’s textbook reserves, which Sage wished he had known about earlier. A first generation student with financial constraints, he described a critical incident in which a biology instructor deviated from the syllabus to use a new textbook: “that was pretty BRUTAL for me buying a hundred and fifty dollar textbook, that wasn’t even worth a hundred fifty.”

Finding Four—Varied Salience of Native American Resources and Exhibits
Students took only seven pictures that focused explicitly on Native American events or cultural exhibits. Although this number of pictures comprises a small amount of photos overall, students narrated the meaning of the photographs at length. All participants referred to aspects of the library related to their individual nation, or Native American identity as a whole. Sage took two pictures of Native Americans in a special “Images of Oklahoma” exhibit, and mentioned that one photo related to his culture and the other represented preserving traditional culture. Three participants discussed the NASA cultural events they attended in the library’s Browsing Room.

Other photographs underscored the support library resources provided for student events, and for tribal paperwork, such as the value of particular rooms to hold events and library scanners for scanning documentation required for tribal scholarships. Two of Megan’s photographs prompted her discussion of absences—what wasn’t in the library—first, a fax machine that would facilitate her ability to efficiently submit her tribal scholarship documentation and a flyer promoting NASA events:

I thought that the little bulletin board was really cool because I noticed a lot of things that I would be interested in that I would otherwise not have any idea about, although I wish more of our Native American stuff was on there [chuckle]...I noticed we didn’t have anything for Awareness Week on there.
Participant data offers a caution common to other research with diverse cultural groups, which is that motivations and allegiances are multidimensional. A participant may always identify with their individual Nation or Native American culture, but individual interests, personality, and field of study also shape perceptions of the library and of higher education in PWIs. Megan emphasized the distinction between what she likes to do as an individual, versus what she thinks other Native American students like to do. For example, she clarified:

I mean I like it here but I know a lot of people that I am friends with that are Native American and they don’t come. Like no one comes to the library. A lot of my friends like in NASA (Native American Student Association) and in stuff, I’m like, “Hey, do you want to go to the Library?” They’re like, “No” ...but I definitely feel like I don’t see very many of my Native American friends here.

Kellie’s perspective underscores the vital role student perceptions of the library might play in their willingness to walk through library doors and avail themselves of the resources. She said:

...when I think of a library I think of something very institutional and educational...sometimes that can be a bit intimidating especially for someone of a minority. You think, “Oh well, I don’t really belong here.” I hear a lot of my students [say things like], “I don’t deserve this” or “That is just too hard” or “That’s only where the smart people go.”

She suggested that the library should “break that stereotype” and convey “this is an environment for all people and it’s not just only the really smart people [who] go here.” For Kellie personally, however, one photo and her words, shown here as a poetic re-presentation, convey her own intentionality upon entering the library:
Kellie’s Library Entrance
When I’m stepping into this magnificent door
I enter a different frame of mind,
an academic frame of mind.
Study,
Focus,
Get this done.
The other three participants had divergent views of
the library as a common space for Native American
students. Amanda elaborated that people who say
they don’t like studying in the library, just really
don’t like studying at all.

Significance
This study is significant for several reasons. First,
it expands the limited research available on Native
American students’ perceptions of the library.
Second, it advances knowledge about how students
persisting toward degree completion use the library
in multidimensional ways, including the meaning
of library resources that may seem “mundane” at
first glance, but cumulatively offer some support
for students’ institutional and academic work. Third,
the photovoice method has not been widely used
for either academic libraries or university settings,
and provides a way of “seeing” that demonstrates
familiar objects and uncovers questions students
have about library resources and how to use them.

Through both method and findings, the research
has practical benefits for librarians who seek
to serve Native American students and/or who
manage the physical facilities of libraries. Providing
exhibits, programs, and materials related to Native
culture is important, but awareness of those
things is equally important. There are practical
benefits for student participants also. First, several
participants expressed financial constraints and
indicated they were motivated to participate
because of the incentive. Second, students’
knowledge of library resources and services
increased, and this may have positive academic
implications for students.

A unique opportunity to share study findings
arose in July 2014 when the Cherokee College
Preparatory Institute was held at OSU. The
weeklong institute was a college readiness program
that connected 54 Native American high school
juniors and seniors with 21 representatives from
12 universities. The PI was invited to coordinate
an “Introduction to the Academic Library.”

Students toured the library, were introduced to
and practiced using online resources, and attended
an informal presentation of the research data.
Findings also informed the session content which
focused on library resources with Native cultural
connections. These high school students learned
what some OSU Native American college students
who are succeeding in college think about the
library. The students were attentive and asked
insightful questions afterward.

Conclusion
Research with Native Americans requires
awareness of and sensitivity to the history
of research on Native American issues and
people marked by colonialism, exploitation,
misunderstanding, and misrepresentation that
has often devalued Native people and ways
of knowing. Given the diversity of sovereign
nations and the individuals who identify as
Native American, and the history of exploitative
research, researchers both within and outside of
the culture must take into account the complexity
of identity and the ways indigenous identities or
tribal affiliation might, or might not, be salient in
library experience.

In 2012 the Association of College and Research
Libraries Racial and Ethnic Diversity Committee
developed Diversity Standards: Cultural
Competency for Academic Libraries based on
the 2001 Standards for Cultural Competence in
Social Work Practice by the National Association
of Social Workers. The eleven standards cover
cross-cultural leadership, skills and knowledge,
library collection development, provision of
library programs and services, linguistic and
workforce diversity, and research. These resources
may help broaden the cultural competency of
librarians who are members of dominant cultural
groups. Future photovoice studies could focus
on exploring other ways the library might better
serve Native American students, as well as other
underrepresented groups. The rich data from this
ongoing study provides more information than
can fit into these proceedings. The authors plan
to continue this study and their data analysis for
future publications.

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Appendix

“Using Photovoice to Explore Native American Students’ Perceptions of the Physical Library”

1. Participant: __________________________________________________________________
2. Gender: Male _____ or Female _____
3. Age: ______
4. Marital Status: Single _____ or Married _____
5. Children: No _____ or Yes _____ If yes, how many? _____
6. List your hometown and state: ___________________________________________________
7. Are you the first in your immediate family to attend college? No _____ Yes _____

**Education**
8. List your year in School: __________________________________________________________
9. List your major field(s) of study: __________________________________________________
10. Do you live on campus? No _____ Yes ____
11. Did you transfer to OSU from another college? No _____ Yes _____

12. Which of the following best describes how frequently you come to the library? (check one)
   1–3 times a week _____ More than 3 times a week _____ Other, List: __________
   1–3 times a month _____ More than 3 times a month _____
   1–3 times a semester _____ More than 3 times a semester _____

13. Which of the following best describes how frequently you use the library’s online resources? (check one)
   1–3 times a week _____ More than 3 times a week _____ Other, List: __________
   1–3 times a month _____ More than 3 times a month _____
   1–3 times a semester _____ More than 3 times a semester _____

14. Which of the following library spaces/seating have you used? (check all that apply)
   1st floor computers/printers _____ Café Libro _____
   2nd floor Browsing Room _____ Soft seating _____
   2nd floor Reading Room _____ Group Study Rooms _____
   2nd floor seating by the exhibits _____ Group Study Tables in the open
   _____
   2nd floor Computer Instruction Room _____ Individual study desks (study carrels) _____
   3rd floor _____ Writing Center Outpost in the Library _____
   4th floor _____ Math Learning Success Center _____
   5th floor _____ Other (please list): _____
   Basement _____

15. Which of the following library services/resources have you used? (check all that apply)
Library desktop computers _____ Large computer monitors _____
Library scanners  _____               Checked out an iPad _____
Checked out a laptop _____       Textbooks on Reserve _____
Interlibrary loan _____           Asked librarian for help _____
Library Reserves _____            Wireless Network connection _____

Checked out a book _____       Library Search Box on homepage _____
Library printers _____           Chat box on library homepage _____
Library databases _____          Digital Library Signage _____

Library website _____          Used book in library, didn’t check it out

Electronic White Board/Projector in Group Study Room _____
Other, please list: __________________

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Commonalities in LibQUAL+® (Dis)satisfaction: An International Trend?

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International research presented in 2013 identified a commonality in library customer satisfaction as measured by the LibQUAL+ survey methodology. LibQUAL+ results from 19 European academic libraries were analysed to explore the differences between customers who were very satisfied and those who were very dissatisfied with the service. The findings established a statistically significant link between customer satisfaction with the Information Control dimension and satisfaction overall, and customer dissatisfaction with the Affect of Service dimension and dissatisfaction overall. The findings concluded that both information resources and customer service affect the overall opinion of the library service for all customer groups. Is this unique to European libraries, or is it an international trend?

The research has now been replicated with the LibQUAL+ survey results from all ARL participants in 2013. To identify the common pattern, results from each of the three dimensions of service quality have been reviewed separately. The survey results from respondents who had given a high satisfaction mean score to one of the three dimensions have been analysed to assess if they had also given high satisfaction mean scores overall. This process has then been repeated for those who had given low satisfaction mean scores. High satisfaction is defined as a mean superiority gap score of larger than zero, indicating desired expectations were exceeded, together with a mean adequacy gap score of more than one, indicating the minimum expectations were clearly exceeded. Low satisfaction is defined as a mean adequacy gap score of less than zero, indicating minimum expectations were not met, together with a superiority gap score of less than minus one, indicating the desired expectations were clearly not met. Statistical analyses are ongoing, however preliminary results show that the same findings exist within ARL Libraries. Respondents with high satisfaction mean scores in the Information Control dimension have the largest positive scores overall, indicating they are the most satisfied customers. Those giving low satisfaction mean scores in the Affect of Service dimension also had the largest negative scores overall, indicating they are the most dissatisfied customers.

Conclusions drawn from these findings should recognise that the research is limited to measuring service quality within the confines of the LibQUAL+ survey methodology. The findings show that easy access routes to good information resources increase customer satisfaction for the entire library. Alongside this, the interaction and support from library staff also play a significant role in the customers’ perception of the library service. Should customers receive a poor level of service from the library staff, it is likely to have detrimental effect upon their view of the entire library. In order to improve customer satisfaction it is vital to improve both the Information Control and Affect of Service elements of the library service.

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A Longitudinal Analysis of 2003–2013 LibQUAL+® Survey Results for the UCLA Library

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Introduction
This paper describes a model that enables a longitudinal comparison of LibQUAL+ data. The model was developed as an assignment in a measurement and evaluation class in the Department of Information Studies at UCLA. The students, working as a consulting team to the Young Research Library at UCLA, applied a metric called a “D-M score” to averaged data. The metric provided an excellent method enabling longitudinal comparison. The paper describes the process and the methods that can be easily adapted to other collections of LibQUAL+ data. The paper includes illustrations of the various charts and graphs that display the application of the metric. The students used data from 2003–2011. After the project was complete the library applied the metric to the 2013 data.

The UCLA Library had a practical problem: how to organize and create a longitudinal analysis of data from its LibQUAL+ surveys, which have been given every other year from 2003–2013. The library was looking for a way to do this that would be simple and easy to replicate with future LibQUAL+ data.

This project offered a way to use data from each instance of the UCLA Library’s LibQUAL+ surveys from 2003–2011 and create a report of results that was easy to understand without requiring sophisticated knowledge of metrics, data sets, and graphs.

The D–M score provided a way to view and understand results obtained from analysis of the raw data and LibQUAL+ scores. This methodology also met another need, to do a longitudinal study of the data, while allowing future data to be incorporated in the same way. The student team created and supplied instructions for applying the D-M score in Excel. The library staff applied the instructions to their 2013 LibQUAL+ survey data, which has been incorporated into this paper.

Another value gained from this project was in working with MLIS students to fill a real need by having them work on a finite problem bounded by the 10-week time length of the course. This engagement helped library staff to professionalize their own experience by working with students in a formal client relationship, and it helped students gain insight into the practical problems faced by libraries when it comes to gathering and interpreting data for purposes of measurement, evaluation, and assessment. Students learned to develop, scale, and complete a project with agreed upon deliverables.

Executive Summary:
This report provides a longitudinal analysis of the 2003–2013 LibQUAL+ survey results administered biannually within the UCLA Library. These findings are of particular importance since the UCLA Library has not performed a longitudinal analysis of the LibQUAL+ results since first administering the survey in 2003. The following report, divided into five sections plus additional appendices, analyzes the results of the LibQUAL+ survey, which has been designed to evaluate users’ perceived levels of service on an individual basis.

The report begins with background information explaining how and why LibQUAL+ was developed. This section traces the developmental process of
LibQUAL+ through the Association of Research Libraries (ARL), and also provides an overview of UCLA’s implementation of the survey. Additionally, this section explains how LibQUAL+ works and the kinds of data the survey collects.

Next, the report explains the current problems and challenges the UCLA Library is facing regarding interpreting the data of LibQUAL+ and establishes the task of performing a longitudinal analysis on the LibQUAL+ data. The following section explains the process and methods used to tackle this problem; this report applies a metric called a “D-M score” to averaged data as an easy way to understand LibQUAL+ survey results. The report then offers an in-depth analysis of this study’s findings, which include the fact that since 2007 the library is at least meeting all users’ minimum perceived levels of service. Within this section the report also includes detailed findings from each question type administered within the LibQUAL+ survey.

The report concludes with recommendations as to how the UCLA Library should proceed in the future in regards to LibQUAL+. Namely, this report recommends that the UCLA Library implement the “D-M score” method, investigate qualitative data, and pursue an approach for building awareness of the survey in order to increase survey response rates and survey reliability.

Attached as appendices to this report are this study’s raw data, a step-by-step guide for the UCLA Library on how to implement this method, and a number of graphs and charts that visually illustrate this study’s findings. The library applied these instructions to its 2013 instance of the LibQUAL+ survey data after the original analysis was completed. This report incorporates the 2013 data analysis with the original analysis of data from the surveys implemented every other year from 2003 to 2011.

LibQUAL+ Background:
LibQUAL+ was intellectually conceived in 1999 by Fred Heath, dean of libraries and holder of the Sterling Evans chair, and Colleen Cook, executive associate dean, and Wright professor of library science for Texas A&M University (TAMU). As stated by Thompson on the LibQUAL+ website:

“Fred and Colleen for some years had realized that use of ‘input’ variables, such as collection or serials counts, were limited as measures of library service quality, especially as the Web and digital content became increasingly ubiquitous.”

Prior to LibQUAL+, libraries were using a similar service called SERVQUAL, which is very similar to LibQUAL+ in that it collected service quality perceptions of samples. However, SERVQUAL was intended for a for-profit business model and therefore did not accurately meet the library needs of TAMU and did not extend to some key elements of library user needs.

Recognizing this gap and the need for library specified information, Cook, who was then a student herself, approached one of her professors, Bruce Thompson. Thompson was a professor of educational psychology and adjunct professor of family and community medicine at Baylor College of Medicine. Cook proposed that Thompson, in conjunction with Heath and herself, develope a modified protocol suitable for use in libraries. Per the LibQUAL+ website, the team “proposed to ARL that the TAMU team would develop this alternative protocol...and would give the protocol to ARL for nonprofit use in improving libraries.”

In January 2000 the American Library Association held its mid-winter meeting in San Antonio. During this conference, a discussion was held regarding the possible pilot testing of an emerging LibQUAL+ protocol. The project was gaining support and was on its way to going from an idea to reality.

In October 2000 Heath, Cook, Thompson, and others described their work to the ARL members at a one-day symposium for ARL library directors presented immediately following the ARL annual meeting. Consequently, with support of ARL and funding provided by the US Department of Education’s funds for the improvement of postsecondary education, the first projected data collection began for the “Service Effectiveness in Academic Research Libraries” (later coined “LibQUAL+”).

During spring 2001 survey results were presented at the 4th Northumbria International Conference in Pittsburgh and the ALA Annual Conference in San Francisco. As Cook noted, “this marked the tradition of LibQUAL+ training programs and reporting of survey results to participants.” From
that point on, LibQUAL+ gained more and more participants every year, eventually becoming the standard of library service survey results in the United States.

LibQUAL+ at UCLA
The library system of the University of California, Los Angeles has used the LibQUAL+ survey since 2003. Administered every other year, the LibQUAL+ survey is distributed to distinct groups on campus: undergraduate students, graduate students, faculty, and staff members. Solicitation for participation in the survey is random. A sample population of each group is selected and e-mailed for their participation in the survey. The survey is completely voluntary, and there is no penalty for not completing the survey.

Survey participants are given roughly a one to one-and-a-half-month window to complete the survey. About halfway through, the library sends a reminder e-mail to participants. UCLA Library subscribes to both the LibQUAL+ Long and LibQUAL+ Lite surveys. LibQUAL+ Lite was developed and introduced because a significant portion of survey respondents commented that the original survey was too long. Now, LibQUAL+ automatically assigns the long or lite version to survey participants when they first log in.

LibQUAL+ collects and reports two types of data, qualitative and quantitative. Qualitative data is in the form of text responses given at the end of the survey. These responses vary and are completely optional. Quantitative data is collected on a sliding scale. For any one survey question, a respondent is asked to classify the statement three ways. The first statement a respondent answers is, “What is the minimum level of service expected on a scale from one to nine?” while the second is, “What is the desired level of service?” The third question seeks the current level of current perceived service.

This survey provides feedback for users of the UCLA Libraries, enabling library administrators to collect data regarding the satisfaction perceptions of its users. It provides feedback from users on different aspects of the library such as the library as place, information resources, and service. Within those users there are several major groups: faculty, staff, graduates, and undergraduates. In order to gather the satisfaction ratings from the library users, LibQUAL+ sends surveys to random users every other year. By splitting the different users, focusing on different aspects of the library experience, and consistently sending a survey every other year, LibQUAL+ allows administrators to get a glimpse of the overall library climate, with the hopes of promoting the positive aspects of the library system while working to raise the satisfaction perceptions of the library environment that generate the least user appreciation.

The Problem: Data Analysis
Traditionally, UCLA Library evaluates LibQUAL+ data year to year, but has never longitudinally analyzed the results across multiple years. Additionally, the current usage of the data is largely sectioned off into different departments, for which a report is generated for their respective department head. Data from the LibQUAL+ report is extracted and used for various administrative reports, but the entire report is never forwarded to university administration. For example, the 2011 LibQUAL+ report for UCLA Library was 107 pages long. Instead of including the entire LibQUAL+ report, library administration extracted applicable portions of the report for department heads and university administration. Reporting extracted data is the preferred method because as a standalone report, LibQUAL+ reports are hard to decipher and understand. In addition, LibQUAL+ questions are changed every year, which adds to an inability to determine trends across several years.

By taking a look at the data collectively and generating a usable methodology for past, present, and future reports, the library administrator will be able to look at the data for each year and condense it into a simple report for the library system as a whole. The task then, as proposed by the deputy university librarian, was to create a method by which to combine and present the past reports longitudinally across the different years and user groups in such a way that could be understood by different members of the library system staff. In addition, a guide or directions were to be created, ensuring that this method could be replicated for future deployment of the LibQUAL+ survey.

The Process: D-M Scores
Upon first glance at the LibQUAL+ raw data, it is easy for a viewer to be overwhelmed by the survey’s rich dataset. The scope of this study is LibQUAL+ data generated from the UCLA Library’s survey from the years 2003 to 2013. The 2013 survey was
be administered during the original writing of this paper, and the data set is now included in this analysis following the library’s own successful application of the formula recommended by the study team. Additionally, due to time and labor constraints, this study has not analyzed any of the qualitative comments from users taking the LibQUAL+ survey. To provide a glimpse of this, consider that the raw data for each year’s survey is broken down into a spreadsheet of 187 columns, and each response creates a new row within the spreadsheet. For example, UCLA’s 2003 survey features 758 rows and 187 columns of data. These columns record information such as a user’s major or field of study, and user group, in addition to the standard LibQUAL+ question responses, such as a user’s minimum, desired, and perceived levels of service for each question asked. There are also responses present for custom questions the library has included in the survey, which are designated as measure outcomes (e.g., “Out1”), along with general satisfaction and use questions.

In order to make sense of this data in a way that would provide the UCLA Library with a method of easily comprehending these scores, in addition to facilitating the process of performing the longitudinal analysis of LibQUAL+ data, we turned to Bower and Dennis’ 2007 article entitled “How to Get More From Your Quantitative LibQUAL+™ Dataset: Making Results Practical,” which offers a metric deemed the “D-M score.”

Seeking a theoretically-sound method of condensing LibQUAL+ data into figures that stakeholders can easily understand, Bradford Dennis of Western Michigan University and Tim Bower of Keuka College published the D-M score method in 2007. The authors found that the previous methods of analysis they encountered were either too complex or did not account for the multifaceted nature of the LibQUAL+ results. As Dennis and Bower point out, the analysis of LibQUAL+ scores requires contextual information since the LibQUAL+ survey is measuring three dimensions of service quality. As a result, the minimum, perceived, and desired scores establish a range of user expressions that are interdependent, and arguably any analysis that does not take all three of these dimensions into account is unsuitable. The pair set out to establish a method that “simultaneously locates the perceived level of service in relation to the minimum acceptable level of service and the desired level of service,” and in doing so created the D-M score, a formula that takes into consideration all three dimensions of LibQUAL+ user service perceptions (minimum, desired, perceived).

Other LibQUAL+ Metrics
In their article, Dennis and Bower lay out three metrics for analyzing LibQUAL+ data: the D-M score, item value ranking, and cross-tabulation. In the many conversations held with the UCLA Library stakeholders, the library expressed the most interest in exploring and applying the D-M score method, since it would ostensibly support longitudinal analysis of the LibQUAL+ survey results since 2003.

Although this study exclusively applied the D-M score method, Dennis and Bower’s other metrics are worth mentioning as they provide additional methods to better analyze LibQUAL+ data as well as offer opportunities for further research. Dennis and Bower suggest using a “relative value formula” to establish the value of library services. While understanding how users value each library service is important, the useful value ranking process that Dennis and Bower offer was outside the scope of this study. Nevertheless, it may be worthwhile to apply value rankings to the UCLA dataset to enable stakeholders to clearly visualize which services across which user groups require the most urgent attention. Given that users may give higher value to certain library services, it is worth mentioning that some D-M scores may be more significant than others, depending on the library service they represent. When used in tandem with the D-M score method, stakeholders can clearly see how well the library is meeting the needs of its users’ most valued services.

Dennis and Bower also discuss cross tabulation, which consists of “the assessment of service quality by user type (or user group), frequency of use, library used most often, and campus affiliation to gain more detailed information about their patrons.” For instance, the comparison of the use of electronic resources by faculty to the overall use of those services may allow stakeholders to identify how well the library is meeting the electronic resource needs of faculty. Cross tabulation was also beyond the scope of this study, as the purpose of this study was to examine the LibQUAL+ data longitudinally, rather than to perform an in-depth study of a particular demographic. Nonetheless,
cross tabulation is a certainly viable method should it fit within the parameters of a study.

Ultimately, we decided to apply the D-M score method to the UCLA dataset based on its ability to accurately measure users’ perceptions of library services in relation to their minimum acceptable level of service and desired level of service. The D-M score method, represented by a single number, also provides a simple and effective way of comparing the different elements of library services over a period of time, which supported our purpose of longitudinally analyzing data. To our knowledge, there has been no further published exploration or application of Bower and Dennis’ D-M score method. Dennis informed us that in addition to his home university, Western Michigan University, other universities including the University of Virginia and the University of Washington have been applying the D-M score method to their LibQUAL+ results.

**How to Calculate the Score**
Calculating the D-M score involves computing a few formulae in order to include all three dimensions of user service perceptions. First, the adequacy gap score can be calculated by subtracting the minimum score from the perceived score. Next, the zone of tolerance can be calculated by subtracting the minimum score from the desired score. To ascertain the D-M score, divide the adequacy gap by the zone of tolerance and multiply the quotient by 100. The resulting D-M score indicates how close the perceived level of service is to the minimum level of service and the desired level of service. The levels of perceived satisfaction and desired satisfaction are measured against the minimums within these dimensions as a way to see if the library is meeting its users’ minimum expectations. The D-M score also measures whether the library is exceeding or failing to meet users’ satisfaction levels. In this way, the D-M score provides a way to derive quantitative meaning from the raw data and make it easier to view and understand the results of a LibQUAL+ survey.

**Applying the D-M Score Formula for the UCLA Library**
Applying the D-M score to a dataset with a spreadsheet application such as Excel is rather intuitive. The D-M score allows one to quickly understand the results from a LibQUAL+ survey without having to study multiple metrics, datasets, or graphs, since the score has accounted for all three LibQUAL+ dimensions in a single score. We applied the D-M score method to averaged scores within each dimension (i.e., D1Avg–Affect of Service, D2Avg–Information Control, D3Avg–Library as Place), creating three D-M scores for each respondent. We repeated the process for D2Avg and D3Avg and then averaged scores within each user group (i.e., undergraduate students, graduate students, and faculty), so that each group had an overall D-M score for each dimension. We averaged the data among each user group for the outcomes (OUT) and satisfaction (SAT) questions.

After utilizing the D-M score method, we found the D-M score allows for easy interpretation of data, as predicted. A score of zero indicates that a user’s bare minimum level of service is being met, while a score of 100 means that a user’s desired level of service is being met. Negative scores indicate that the library is not meeting a user’s minimum level of service, while a score of above 100 means that the library is exceeding users’ desired levels of service. Bower and Dennis point out another way of interpreting the results: “A D-M score of 64.40 would indicate that the library is closer to the desired level of service than to the minimum level of service. In other words, the library is 64.40% of the way to meeting the patron’s desired level of service.” To provide an example, if D1AvgMin is 5.75, D1AvgDes is 7.75, and D1AvgPer is 7.625, the resulting D-M score formula is \[(7.625 - 5.75) / (7.75 - 5.75)\] * 100 = 93.75. This score designates that the library is 6.25 points away from meeting the user’s desired level of service.

As Dennis and Bower acknowledge, the D-M score method does not account for statistical dispersion, meaning the formula does consider measures such as variance or standard deviation. In practice, this means that it is difficult to draw comparisons when two D-M scores are relatively close. Although the D-M score is a rather robust method, its contextual basis means there is no pre-defined rubric as to what constitutes an adequate or excellent score. Instead, such measures of excellence may vary from library to library and even year to year, depending on the statistical dispersion of the dataset. Although this method may prevent benchmarking, this should not undermine the value of the D-M score method, especially considering its ability to easily communicate results to stakeholders.
Findings: Overview

Affect of Service
The scores for all user groups fluctuate throughout the years with student groups’ scores heading in an upward trend, while the other three groups declined. From 2007 to 2011, the D-M scores for all user groups exceed zero, indicating that the library is at least meeting all users’ desired minimum levels of service. However, scores from faculty have declined significantly, dropping from 53 in 2011 to -31 in 2013. There is also a noticeable drop in 2013 scores by graduate students, from 76 to 62 though their 2013 scores are still well above 0. However, undergraduate scores increased from 54 to 65 in 2013, indicating an increase for this demographic.

Information Control
Overall, satisfaction levels for users within undergraduate, faculty, and staff remain consistently positive. The 2013 survey indicates upward trends although there is a slight drop in faculty scores. Overall, the minimum satisfaction levels have stayed in the positive and may potentially grow stronger in coming survey years.

Library as Place
It appears that the overall perceived level of satisfaction with the physical space of the libraries, with the exception of undergraduates, has fluctuated throughout the years, falling below minimum satisfaction levels in previous surveys, trending upward in 2011, but falling dramatically in 2013. The library as place looks to at least be meeting users’ minimum level of satisfaction, but has declined for students and dropped below minimum level for faculty.

Information Literacy Outcomes (OUT)
These questions ask users how strongly they agree with statements indicating how much the library assists them with their academic, professional, and overall information literacy development. Generally, the average agreement for all five of the OUT statements for each of the user groups, excluding staff, ranges from the mid-fives to high-sevens, meaning that they believe the library, in some way, aids in their academic, professional, and overall information literacy development. Their agreement tends to increase over time and stay constant in current surveys, but does not normally increase or decrease more than one full point from the first survey to the last. Conversely, we can see that staff have some agreement averages jumping more than one point, to an eight or nine, showing that this user group strongly believes the library aids in their IL development.

Library Use (USE)
These questions ask users how frequently they use library resources on campus and off campus and non-library gateway resources.

Undergraduates
The majority of undergraduates submitted responses of “weekly” or “daily” to each of the USE questions, suggesting high usage rates. Consistently, the majority of undergraduate respondents answered that they use non-library gateway resources (Google, Yahoo, etc.) daily.

Graduates
The most common answer for graduate student respondents who used library resources on and off campus was “weekly” for all six years of the survey. However, the proportion of “daily” responses for how often graduate students use non-library gateway resources is far greater than those who use library resources, and this number appears to increase with every year the survey is given.

Faculty
Within each question, the proportion of faculty for the majority of the categories roughly stays the same. The majority of faculty who use library resources at the library answered that they do this weekly in early survey years, but “monthly” and “quarterly” answers have increased in recent years. The majority of faculty who use the library webpage to access resources do this daily, although “weekly” answers increase from year to year. The largest proportion of faculty for every survey answered that they access non-library resources on a daily basis.

Staff
Most staff members responded using resources through the physical library weekly or monthly, and using resources through the library webpage on a daily or weekly basis. There is a consistent trend of daily use of non-library gateway resources among the respondents for all of the years. Staff responses for the 2013 survey were inconclusive.

Library Satisfaction (SAT)
These questions ask users how satisfied they are with library services.
SAT 1: With the exception of undergraduates in 2003, the library has consistently received an average score of 7.0 or higher in all user groups. Although there is fluctuation of 0.5 to 1.0 between the survey years, users are showing consistent agreement with the statement. In 2013, staff respondents gave the library an average score of 9, the highest score it received out of all the user groups during any year of the survey.

SAT 2: Since 2003, the library has been rated no lower than 6.5 by all the user groups. Scores tend to rise from year to year, with the lowest 2013 score of 6.88 given by faculty. The highest score was given by staff in 2011 at 8.3.

SAT 3: In general, all user groups are satisfied with the service from the UCLA Library. From 2003 to 2013, there has been an overall increase in the average score from all user groups. The most noticeable increase in scores is that of the staff group, whose scores rise from 7.1 in 2003 to 9 in 2013. The core user groups, undergraduates, graduates, and faculty, have consistently been satisfied with the UCLA Library year after year.

Findings: In-Depth Analysis

Affect of Service
The D-M scores across the Affect of Service category show a variety of results. To begin, the staff scores dramatically decreased from 2003 (~100) to 2005 (~0), before increasing in 2007 and declining again through 2011. Undergraduates, meanwhile, demonstrate the smallest amount of fluctuation within this graph, exhibiting a small decline from 2003–2005, and steady increases from 2005–2011. Graduates showed a similar trend, with scores increasing sharply from 2003–2007, before declining from 2007 to 2009, and increasing for the 2011 survey. Faculty scores steadily rose across the surveys studied until 2011, when the scores decreased slightly and then significantly in 2013 as sharply as -30.45. From the point of view of the library, these declining scores point out the need to follow up with faculty and graduate students to learn about the source of these downward trends. Between 2011 and 2013, however, the increase in undergraduates’ scores in this category may be related to the rollout of several initiatives directed at improving undergraduate library services.

Information Control
The scores for questions regarding Information Control have been somewhat steady for the undergraduate and faculty user groups. For faculty in particular, the scores have indicated steady levels of satisfaction, and the scores have never gone over the boundaries of the 1–100 scores, indicating positive results consistently from 2003 to 2013. A small decrease in faculty scores between 2011 and 2013 should be noted, however, this seems consistent with the trend of fluctuating scores from year-to-year for this group. Undergraduate and staff users did dip slightly from 2003 to 2007, yet from that point on the scores trend mostly consistently in the positives, and seem to run almost parallel with the scores of the faculty users.

The largest fluctuation lies with the graduate users, who initially scored consistently with marginally below average satisfaction results for the 2003 and 2005 surveys, then spike up sharply for the 2007 survey with satisfaction levels at more than 300 times greater for this user group. However, graduate scores are then greatly reduced by the 2009 survey, which trends at just below 0 for user satisfaction. The survey in 2011 indicated an upward trend, with minimum satisfaction levels just barely reaching positive numbers, then increasing significantly in 2013 to 31.63.

Overall, satisfaction levels for users within undergraduate, faculty, and staff remain consistently positive for the most current surveys, although no scores are available for staff in the 2013 survey. The staff scores were never intended to be part of the survey originally. When the samples are chosen each year at random, sometimes there are students or faculty members who are also staff members and who choose to affiliate with that category when they answer the survey. The library chose to remove the staff category of data from the 2013 dataset. Users within the graduate group have undergone major negative trends for information control and continue to be more of a concern as the years progress. The graduate student category is increasingly of concern to the library; the library has been inspired by the LibQUAL+ data from graduate students to pursue further surveys and focus groups with this category of user.
Library as Place
In analyzing the four user groups throughout a ten-year period, from 2003 to 2013, it appears that the perceived level of satisfaction with the libraries at UCLA, for all but one of the user groups, has increased until 2013.

The perceived level of quality by graduate students and staff members who participated in the LibQUAL+ surveys has fluctuated very similarly throughout the years. In 2003, 2005, and 2009, both the graduate students and staff groups rated the Library as Place as below their minimum expectations, however, there was a bump in ratings for both groups in 2007; graduate students rating the LP at 38.34 and staff giving a rating of 66.67. Staff has rated the Library as Place at a higher average than grad students, except for in 2009 where their perception dips to -29.68 (down from the 60+ score in the previous year’s survey), whereas grad students’ average score is 8.22 points away from meeting their minimum level of acceptable service quality. In 2011, both groups’ scores were well above the minimum level of service quality, with staff’s perception of Library as Place rising faster than grad students’. In 2013, graduate students’ scores dropped to just above the minimum level of satisfaction, indicating a downward trend. A hypothesis of this drop in graduate students’ scores is that the recent renovations of the Young Research Library’s first and second floors in 2011 caused an influx of undergraduate usage of the new spaces, of which the graduates felt displaced. The library has confirmed this with graduate students in separate surveys. No 2013 data is available for staff, for reasons described above.

Faculty perceptions seem to mirror graduate students in all years except for 2007 and 2013. Faculty rated the Library as Place as not meeting their minimum expectations in all years except for 2011. They scored it at -78.02 in 2003, -52.76 in 2005, and -81.04 in 2007. In 2009, their average perception rose to -7.05, and increased to 28.42 in 2011, appearing to be headed in an upward direction, but falling far below 0 to -69.46 in 2013. This is a concern for the library, given that there was a major renovation of the main floor and Level A of the Charles E. Young Research Library in 2011.

Undergraduates showed the least fluctuation in perceptions of the Library as Place. They were the only group to rate the physical space of the libraries at UCLA as at least meeting their minimum expectations for every year. Their lowest score was in 2005, rating the Library as Place at 1.45, but scores rose significantly in 2009 to 44.1 and continued to rise in 2011 to 50.83. Surprisingly, the average undergraduate score for the Library as Place fell in 2013 to 29.07, indicating that the library was performing closer to their minimum level of satisfaction and farther from their desired level of satisfaction than in the previous two survey years. No undergraduates completed the LibQUAL+ survey in 2007. The library is pursuing some changes in physical spaces in the Powell Library that are aimed at undergraduates, and the 2015 survey should provide information on the influence of these changes on undergraduates’ perceptions of the Library as Place.

Information Literacy Outcomes (OUT)
OUT 1: “The library helps me stay abreast of developments in my field(s) of interest.”

Staff scores on this question fluctuated widely from 2003–2011, reaching a low in 2007 with a score of 5.8, before peaking in 2009 and leveling off in 2011 with a score above 7.5. No staff scores are available for 2013, as previously mentioned. Graduate students had similar fluctuating attitudes regarding this question, peaking in 2007 with a score just below 7, before returning to a score between 6 and 6.3 from 2009–2013. Faculty responses demonstrated little change from 2003–2013 for this question. The faculty response score consistently fell between 6.5 and 7. Undergraduates meanwhile remained relatively consistent from 2003–2009, peaking at a score just above 6 in 2011, before falling to 5.83 in 2013. There is a renewed interest in the library in working on this issue with undergraduates and graduate students; however, there is clear indication here that this work should include outreach to faculty members as well.

OUT 2: “The library aids my advancement in my academic discipline or work.”

From 2003–2007, staff and graduate responses are remarkably similar, increasing in 2005, while decreasing in 2007 before increasing again in 2009. Of all user groups, staff scores peaked with a score of 8.5 in 2011 then fell to an 8 in 2013. Faculty and undergraduates, meanwhile,
showed smaller degrees of fluctuation, as faculty slowly increased to a score of ~7.75 in 2011 then decreased almost a full point to 6.9 in 2013. Undergraduate student scores steadily increased from a ~6.25 in 2003 to scores above 7 in 2011 and 2013. The library staff would like to think that the improvement in undergraduate scores relates to increased effort in this area for undergraduates, but there is room for more effort here.

OUT 3: “The library enables me to be more efficient in my academic pursuits or work.”

Staff scores stayed constant from 2003 to 2007 at 7.3, but began to increase in 2009 and in 2011 and 2013, reached a score of 9, indicating that this group agrees that the library enables them to efficiently pursue their academic and professional interests. Undergraduate and faculty scores did not change as much, but both have increased slightly over the years. There is no data for undergraduates for 2007, but their scores remain fairly constant, barely rising from 7.1 in 2009 to 7.2 in 2011 remaining fairly consistent going on to 2013. Faculty scores may have changed the least, but they rated the library at a higher average than students. In 2003 and 2005, faculty rated the library at an average of 7.1. This rose to 7.4 in 2007 and leveled off at 7.5 in 2009 through 2013. Graduate student scores rose from 2003 to 2007, from 6.9 to 7.5, but decreased slightly in 2005 to 6.8. The average fell in 2009 to 7.2, but began to rise again in 2011 to 7.3 and stayed fairly constant in 2013 at 7.25. The library’s interpretation of this data is that this score needs attention to ensure that it stays the same or improves.

OUT 4: “The library helps me distinguish between trustworthy and untrustworthy information.”

This statement had the overall lowest scores of the OUT questions for every user group studied. Although the scores generally increased throughout the years, they stayed mainly within the fives for the undergraduates, graduates, and faculty groups. Graduates’ and undergraduates’ average agreement with this statement rose above a 6 in 2011 and 2013, which is an improvement, but the library should still aim to raise it even higher. Faculty is the only group whose average score did not increase from 2009 to 2011, it instead leveled off at 5.5 but fell to 5.2 in 2013. This indicates that the library’s three core user groups somewhat agree that the library helps them distinguish between trustworthy and untrustworthy information. From the library’s perspective, this is one of the areas the library regularly identifies as an important added value that it provides to users. The weak responses mean that the library needs to improve its messaging and performance here.

OUT 5: “The library provides me with the information skills I need in my work or study.”

The scores for users with undergraduate, graduate, and faculty all remain fairly consistent, with scores that generally range between 5.6 and 6.8. Each of these three users also trend positively toward 2013, with both undergraduate and graduates response scores at 6.7 and 6.8. Staff members have had the largest fluctuation in scores. From 2003 to 2005, the scores remained constant at mid-6. In 2007, the staff scores suddenly dropped to 5 then steadily increased by two points during the following years. This steady increase eventually culminated in a score of 9 in 2011, representing the highest score for this question from 2003–2011. There are no staff responses for 2013, as discussed above. The library intends to focus on undergraduate and graduate students in ensuring the consistent positive trend in this category.

Library Use (USE)

USE 1: “How often do you use resources on library premises?”

Undergraduate responses were consistent from 2003–2013, as a majority of respondents indicated that they used resources in the physical library on a daily or weekly basis. This indicates that physical usage among undergraduates has remained high from 2003–2013.

The most common answer for graduate students was “weekly” for all six years of the survey. The second most frequently chosen answer was “monthly” in all years but 2003 and 2007. The number of “daily” and “quarterly” answers was almost exactly the same in all years but 2003 (and discounting 2007), where “daily” was chosen twice as often. “Never” was the least chosen response for graduate students every year, except for 2007 where only four graduate students responded. Note
that although 2011 had the most graduate student respondents, the percentage of those who answered “weekly” has decreased compared to 2003 and 2005, while the percentage of respondents to “monthly” and “quarterly” has (for the most part) increased.

Most faculty members reported accessing resources through the physical library on a weekly basis, except for 2007 and 2013. The number of faculty participants dropped throughout the years, as has the percentage of those who access the physical library daily. The proportion of faculty who answered “monthly,” “quarterly,” and “never,” has increased since 2003. These findings, when compared with USE 1 and USE 3, indicate that faculty are moving towards electronic means rather than the physical library to access resources. This is in keeping with what faculty members tell the library about their use of and desire for electronic access to resources.

With regards to general staff, in 2003, the majority of respondents indicated weekly and monthly use. After this year, the number of respondents drastically decreased. Regardless, from 2005–2011, it can be seen that no respondents utilized resources daily. Rather, they generally used resources on a weekly, monthly, or quarterly basis. This may suggest that the job category or the daily job requirements of the staff members does not require frequent usage of library resources on premises. Staff responses for 2013 are omitted.

USE 2: “How often do you access library resources through a library Web page?”

The majority of undergraduates indicated that they accessed library resources through a library webpage on a weekly or monthly basis. This lower level of online use may be explained by the fact that the majority of undergraduates tend to use resources on the library premises, as explained by question USE 1. Of all three USE questions, this question received the most “never” responses from undergraduates. This suggests that there may be an opportunity here to further educate undergraduates on the resources that are accessible through the library’s webpage. The library is using a variety of analytical tools to understand better where undergraduates access online information; this also has led the library to work harder to demonstrate to undergraduates how to access library resources remotely.

The most common response for graduate students who were asked how frequently they access resources through a library web page was “weekly” for all years but 2007. The number of graduate students who answered “daily” has also stayed constant in the 60s for 2003, 2005, 2011, and 2013 which all had a similar number of total graduate respondents. The lowest number of responses belonged to “never,” but 2011 had the highest “never” responses. The increased answers for “never,” “quarterly,” and “monthly,” however, do not appear to be having a negative impact on the number of graduate students who access library resources through library web pages on a daily or weekly basis. This is in keeping with other information that the library has obtained from graduate students.

While the number of faculty participants decreased quite dramatically every year from 2003 to 2013, it is still evident that most access resources through the library webpage on a daily or weekly basis.

For general staff, most used resources through the library webpage on a daily or weekly basis. It can also be noted that in 2003 and 2005, a few respondents also indicated use on a monthly basis. When looking at these results critically, one can gather that staff use resources through a library webpage (USE2) more frequently than they use the resources on library premises (USE1). This information fits with anecdotal data the library has received from staff members.

USE 3: “How often do you use Yahoo, Google, or non-library gateways for information?”

Undergraduates are overwhelmingly using Google or non-library gateways to seek information; from 2003–2013, over 69% of undergraduates indicated that they used these means of seeking information on a daily basis. For all years of the survey except 2007, at least 90% of undergraduates answered that they use non-library gateways for seeking information on a daily or weekly basis.

The majority of graduate students answered “daily” to this question for every year of the survey. The percentage of “daily” responses constitutes over
70% of those taken for every year of the survey, a very similar finding to undergraduates’ information seeking behavior. The number of those who answered “monthly,” “quarterly,” and “never” stays somewhat constant every year, discounting 2007, because of its low response rate.

Faculty follow the same trend as students, with the majority of survey respondents saying they use non-library gateways daily for every year of the survey. Faculty “weekly” responses are the second most commonly chosen answer for every year, although the number of “daily” responses far outnumber that of the other four choices combined.

Staff scores display a strong trend indicating frequent, daily use of non-library gateways. In 2003, some respondents indicated weekly or monthly use of these gateways. Conversely, in 2007 and 2011 all of the respondents used these gateways daily. This might suggest an increasing trend in daily use of these non-library gateways for seeking information.

For all categories, this trend has been evident for some time. The library has responded by offering classes on how to use specific non-library gateways more effectively, and how to use and access library resources via these means. This issue will continue to grow as more and more options become popular for all user groups.

Library Satisfaction (SAT)
SAT 1: “In general, I am satisfied with the way I am treated at the library.”

Undergraduates showed the least agreement with this statement, rating it at an average of 6.9 in 2003, but increasing through the years to 7.4 in 2011 and slightly decreasing to 7.3 in 2013. The graduate, faculty, and staff groups show an agreement average between 7 and 9 points for all years of the survey, showing that they are quite satisfied with the way they are treated at the library. The most noticeable growth is in staff ratings, which increase from 2005 until dropping in 2011, and then increasing to the highest score of 9 in 2013. The library is deeply concerned with this issue, and a significant effort has begun to improve the scores for all user groups in this category.

SAT 2: “In general, I am satisfied with library support for my learning, research, and/or teaching needs.”

The library’s three main user groups: undergraduates, graduates, and faculty, have roughly averaged the same score year to year with their 2013 average being between 6.8 and 7.4. A score of 6.8 to 7.4 is positive but leaves room for improvement. The average scores from university staff have increased about 1.5 points from 2003 to 2011, rising to 8.3 which indicate they are generally satisfied with the library’s support for their learning and research needs. Staff scores for 2013 are inconclusive. The library is concerned with improving these scores generally, but the longitudinal analysis shows the library has failed to do so over time.

SAT 3: “How would you rate the overall quality of the service provided by the library?”

Undergraduate scores remain constant from 2005 to 2013, at an average of 7.3. Graduate and faculty scores trend upward, then fall slightly, but never dip below 7.2 on the three most recent surveys, indicating they have been continuously satisfied with the overall quality of service provided by the library. Like SAT 1 and SAT 2, there is an extreme upward trend from the staff user groups. While most user groups hovered between 7.0 and 7.5, staff saw increases to 8.2 in 2011 and 9 in 2013, indicating that they are very much satisfied with the quality of service provided by the library.

Recommendations
D-M Score Method
Apply the D-M score formula to future LibQUAL+ data. The D-M score method, which was developed by data analysis experts at Western Michigan University, was essential to the longitudinal study the consulting team conducted. By using this method, we were able to interpret users’ perceptions of the library and its services in relation to their minimum and desired levels of service efficiently and in the limited time allotted for the study (nine weeks). In order to more easily manage and present the scores, the team calculated D-M score averages for the three main areas of service (Service Affect, Information Control, and Library as Place), for each user group, for every year of the survey, resulting in (ideally) four
D-M scores per year. All of our calculations were applied through formulas within Microsoft Excel spreadsheets. We recommend that the client utilize the D-M score method to make sense of future LibQUAL+ data and to efficiently continue conducting longitudinal analyses. The team has created and supplied instructions for applying the D-M score formula in Excel, see Appendix 3: Data Analysis Instructions.

The library staff applied the formula to the 2013 data that are incorporated in the findings discussed above. Overall, the longitudinal view of the data gives new and greater value to all of the data from a decade of surveys. The trends that show in each area are different for each category of user, highlighting the library’s successes as well as areas where the library needs to reinvigorate focus and efforts. From the library’s perspective, having a means of creating a longitudinal data display renews our interest in mining the library’s LibQUAL+ data.

**Study Qualitative Data**

Perform an analysis of the qualitative data from the LibQUAL+ survey. As previously mentioned, because of time and labor constraints, the consulting team was unable to analyze responses given in the comments section of the LibQUAL+ surveys. However, while the quantitative data taken from the gap analysis, information literacy outcomes, and library use questions are invaluable, comments given in the open-ended section will offer greater context for the trends found from the longitudinal study. In other words, we recommend the use of the qualitative responses to help explain why users have given the library and library services particular scores. An interesting project could be to analyze staff comments to determine why this user group has generally given the library higher SAT and OUT scores every year as compared to the three other user groups. The application of text mining tools may be of assistance in gathering and analyzing the comments.

**Build Awareness**

Developing an approach for building awareness of the survey will increase response rates. The consulting team found that efforts made to inform UCLA students, staff, and faculty about the LibQUAL+ survey and how the UCLA library will use their responses were lacking. The team also found that the number of faculty respondents has decreased over time, and other user groups had zero respondents in certain years of the survey. Building awareness around the survey and the value of the users’ responses will provide the library with a greater sample size that will better represent the UCLA population. The library adds that publicizing the data from the surveys, along with publicizing library activities that have been inspired by it, would be an additional means of building awareness and creating a sense of users’ investment in responding to the survey.

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**Notes**


2. Ibid, 11.


6. Ibid., 11.
7. Ibid., 15.
8. Ibid., 17
9. Ibid.
10. Ibid, 12.
Appendix 1: List of Data Tables

Table Set 1: Calculated D-M Score
1-1 Affect of Service 1-2 Library as Place 1-3 Information Control

Table Set 2: Outcome Questions
2-1 “The library helps me stay abreast of developments in my field(s) of interest”
2-2 “The library aids my advancement in my academic discipline or work”
2-3 “The library enables me to be more efficient in my academic pursuits or work”
2-4 “The library helps me distinguish between trustworthy and untrustworthy information”
2-5 “The library provides me with the information skills I need in my work or study”

Table Set 3: Satisfaction Questions
3-1 “In general, I am satisfied with the way in which I am treated at the library”
3-2 “In general, I am satisfied with library support for my learning, research, and/or teaching needs”
3-3 “How would you rate the overall quality of the service provided by the library?”

Table Set 4: Usage Data
4-1 “How often do you use resources on library premises?”
4-2 “How often do you access library resources through a library Web page?”
4-3 “How often do you use Yahoo, Google, or non-library gateways for information?”

Calculated D-M Scores (Tables 1:1-3)

Table 1-1: Affect of Service

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<th>Year</th>
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<th>Graduate</th>
<th>Faculty</th>
<th>Staff</th>
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Table 1-2: Library as Place

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Table 1-3: Information Control

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Outcome Questions (Tables 2:1–5)

Table 2-1: “The library helps me stay abreast of developments in my field(s) of interest”

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Table 2-2: “The library aids my advancement in my academic discipline or work”

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Table 2-3: “The library enables me to be more efficient in my academic pursuits or work”

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Table 2-4: “The library helps me distinguish between trustworthy and untrustworthy information”

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Table 2-5: “The library provides me with the information skills I need in my work or study”

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Satisfaction Questions (Tables 3:1–3)

Table 3-1: “In general, I am satisfied with the way in which I am treated at the library”

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Table 3-2: “In general, I am satisfied with library support for my learning, research, and/or teaching needs”

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Table 3-3: “How would you rate the overall quality of the service provided by the library?”

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**Usage Data (Tables 4:1–3)**

Table 4-1: “How often do you use resources on library premises?”

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Table 4-3: “How often do you use Yahoo, Google, or non-library gateways for information?”

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Appendix 2: List of Graphs

Graph 1-1: Affect of Service
Graph 1-2: Library as Place
Graph 1-3: Information Control
Graph 2-1: “The library helps me stay abreast of developments in my field(s) of interest”
Graph 2-2: “The library aids my advancement in my academic discipline or work”
Graph 2-3: “The library enables me to be more efficient in my academic pursuits or work”
Graph 2-4: “The library helps me distinguish between trustworthy and untrustworthy information”
Graph 2-5: “The library provides me with the information skills I need in my work or study”
Graph 3-1: “In general, I am satisfied with the way in which I am treated at the library”
Graph 3-2: “In general, I am satisfied with library support for my learning, research, and/or teaching needs”
Graph 3-3: “How would you rate the overall quality of the service provided by the library?”
Graph 4-1: “How often do you use resources on library premises?”
Graph 4-2: “How often do you access library resources through a library Web page?”
Graph 4-3: “How often do you use Yahoo, Google, or non-library gateways for information?”
Graph 5-1: “How often do you use resources on library premises?”
Graph 5-2: “How often do you access library resources through a library Web page?”
Graph 5-3: “How often do you use Yahoo, Google, or non-library gateways for information?”
Graph 6-1: “How often do you use resources on library premises?”
Graph 6-2: “How often do you access library resources through a library Web page?”
Graph 6-3: “How often do you use Yahoo, Google, or non-library gateways for information?”
Graph 7-1: “How often do you use resources on library premises?”
Graph 7-2: “How often do you access library resources through a library Web page?”
Graph 7-3: “How often do you use Yahoo, Google, or non-library gateways for information?”
Graph 8-1: “How often do you use resources on library premises?”
Graph 8-2: “How often do you access library resources through a library Web page?”
Graph Set 1: Calculated D-M Score

1-1 Affect of Service

Affect of Service

1-2 Library as Place

Library as Place
1-3 Information Control

Graph Set 2: Outcome Questions
2-1 “The library helps me stay abreast of developments in my field(s) of interest”
2-2 “The library aids my advancement in my academic discipline or work”

The library helps me stay abreast of developments in my field(s) of interest.

![Graph showing response average scores over years for different groups: Undergraduate, Graduate, Faculty, Staff.]

2-3 “The library enables me to be more efficient in my academic pursuits or work”

The library enables me to be more efficient in my academic pursuits or work.

![Graph showing response average scores over years for different groups: Undergraduate, Graduate, Faculty, Staff.]

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2-4 “The library helps me distinguish between trustworthy and untrustworthy information”

2-5 “The library provides me with the information skills I need in my work or study”
**Graph Set 3: Satisfaction Questions**

3-1 “In general, I am satisfied with the way in which I am treated at the library”

In general, I am satisfied with the way in which I am treated at the library.

3-2 “In general, I am satisfied with library support for my learning, research, and/or teaching needs”

In general, I am satisfied with library support for my learning, research, and/or teaching needs.
3-3 “How would you rate the overall quality of the service provided by the library?”

Graph Set 4: Undergraduate Usage Data

4-1 “How often do you use resources on library premises?”
4-2 “How often do you access library resources through a library Web Page?”

(Undergraduate) How often do you access library resources through a library Web page?

4-3 “How often do you use Yahoo, Google, or non-library gateways for information?”

(Undergraduate) How often do you use Yahoo, Google, or non-library gateways for information?
Graph Set 5: Graduate Usage Data

5-1 “How often do you use resources on library premises?”

(Graduate) How often do you use resources on library premises?

Year:
- 2003
- 2005
- 2007
- 2009
- 2011
- 2013

Number of Responses:
- Never
- Quarterly
- Monthly
- Weekly
- Daily

5-2 “How often do you access library resources through a library Web page?”

(Graduate) How often do you use resources on library premises?

Year:
- 2003
- 2005
- 2007
- 2009
- 2011
- 2013

Number of Responses:
- Never
- Quarterly
- Monthly
- Weekly
- Daily
5-3 “How often do you use Yahoo, Google, or non-library gateways for information?”

(Graduate) How often do you use Yahoo, Google, or non-library gateways for information?

Graph Set 6: Faculty Usage Data
6-1 “How often do you use resources on library premises?”

(Faculty) How often do you use resources on library premises?
6-2 “How often do you access library resources through a library Web page?”

(Faculty) How often do you access library resources through a library Web page?

Number of Responses

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6-3 “How often do you use Yahoo, Google, or non-library gateways for information?”

(Faculty) How often do you use Yahoo, Google, or non-library gateways for information?

Number of Responses

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Graph Set 7: Staff Usage Data
7-1 “How often do you use resources on library premises?”

(Staff) How often do you use resources on library premises?

7-2 How often do you access library resources through a library Web page?”

(Staff) How often do you access library resources through a library Web page?
Appendix 3: Data Analysis Instructions

Part A. How to Calculate and Interpret Raw Data

1. Download raw data file from the LibQUAL+ Data Repository. Download the raw data’s Data Key as well.
2. Open Microsoft Excel, or other spreadsheet software, and save file as .xls or .xlsx.
3. Delete all columns before UGroupID and all columns between UGroupID and D1AvgMin. Then delete columns D1AdqGap, D1SupGap, D2AdqGap, D2SupGap, D3AdqGap, and D3SupGap.
4. Then delete all columns including and to the right of the “Demo” columns.
5. Sort by Column A/UGroupID.
6. After deleting the unused columns, match the names of the columns with the data key. (For example, change UGroupIDs to the correct name category.)
7. Create columns for D-M score (Ex: D1 D-M score, D2 D-M score, etc.) and follow this Excel equation (replace the B, C, D with the applicable columns):

\[
= \left( \frac{D2-B2}{(C2-B2)} \right) \times 100
\]

Hint: to apply equation to all columns, enter equation into the first cell and put cursor in corner until it creates a cross symbol then drag down to rest of column.

8. Split rows between user groups. Insert two blank rows.
9. For the average D-M score, enter this formula at the bottom of the column:
=AVERAGEIF(E2:E616, "<>#DIV/0!")

Hint: Then for D2 D-M score, apply D-M formula, use same steps but make sure to change to correct columns.

10. To get results for OUT and SAT average first row and last row for each user group.
11. To get results for USE, manually count each time the number of usage term appears. For example, count the number of “daily, weekly, monthly, quarterly, and never” appears for all undergraduates.
12. Enter the data into a separate spreadsheet to create graphs.

**Part B. How to Create Graphs**
The data from each year has to be extracted and compiled onto one spreadsheet in order to make a graph. There are different instructions to compile the D-M score data, the “OUT/SAT” data, and the “USE” data.

**D-M Score Graphs**
1. Create a spreadsheet where the columns are the user groups and the rows are survey years.
2. Make a separate table for each D-M score topic (affect of service, library as place, and information control).
3. Enter in data from annual LibQUAL+ data. If there is a value that is not available, do not put “N/A.” Use the Excel equation =NA(). When creating the graphs, this means this data point is skipped instead of being interpreted as a zero.
4. Highlight the table and choose a graph format (line or scatter is preferred).
5. Format the graph with axis labels and a title.

**OUT/SAT Graphs**
1. Create a spreadsheet where the columns are the user groups and the rows are survey years.
2. Make a separate table for each OUT or SAT question asked.
3. Enter in data from annual LibQUAL+ data. If there is a value that is not available, do not put “N/A.” Use the Excel equation =NA(). When creating the graphs, this means this data point is skipped instead of being interpreted as a zero.
4. Highlight the table and choose a graph format (line or scatter is preferred).
5. Format the graph with axis labels and a title.

**USE Graphs**
1. Create a spreadsheet where the columns are the survey years and the rows are the question responses (daily, weekly, monthly, quarterly, or never).
2. Make a separate table for each user group (undergraduate, graduate, faculty, library staff, and staff).
3. Enter in data from annual LibQUAL+ data. If there is a value that is not available, do not put “N/A.” Use the Excel equation =NA(). When creating the graphs, this means this data point is skipped instead of being interpreted as a zero.
4. Highlight the table and choose “Column” graph, stacked column.
5. Format the graph with axis labels and a title.

How to update graphs for LibQUAL+ Data
1. Open the applicable excel file and add a column for the new year (2013). Enter in the new data.
2. Right click on the graph you want to update and choose “Select Data” and expand the data range to include the new year’s data. The graph should automatically update and redraw any trend lines.
A 15-Year Retrospective on LibQUAL+®

Martha Kyrillidou  
Association of Research Libraries, USA

Colleen Cook  
McGill University, Canada

Fred Heath  
University of Texas, USA

Steve Hiller  
University of Washington, USA

J. Stephen Town  
University of York, United Kingdom

Bruce Thompson  
Texas A&M University, USA

This paper was part of a panel presentation that included remarks from Fred Heath, Steve Hiller and Stephen Town. The slides for this presentation can be found at: http://libraryassessment.org/bm-doc/3kyrillidoupanel.pdf.

Abstract
The purpose of the panel was to provide a 15-year retrospective on the lessons learned from the LibQUAL+ protocol and the hundreds of implementations in libraries across the globe over the last 15 years. The panel was composed of thought leaders who have diverse and engaging perspectives on the value of this protocol. The panel was also a platform for key ways of engaging with the participants. Fred Heath engaged us with exciting and provocative questions as he related to us the genesis of LibQUAL+ at Texas A&M and his experiences using it at the University of Texas and with ideas on how to move forward. Stephen Town offered us perspectives from across the pond from the years he was at Cranfield University to the years at the University of York (UK), while also deeply engaged at a national and international level in library performance measures. Martha Kyrillidou provided perspectives on engaging a growing community in understanding a model that has universal implications in describing the role of libraries, their trends, and trajectories. She offered analysis on looking at trends for different user groups and highlights some of the necessary future directions where library assessment is heading.

From LibQUAL+ to a Gateway of Library Assessment Tools: StatsQUAL®—the Diversification of Library Assessment
One Size Does Not Fit All: StatsQUAL Diversity
ARL has recognized that one size does not fit all from the early days of implementing tools. LibQUAL+ was characterized as one way of multiple methods of listening to users and as a result there was organizational commitment to explore many additional directions and establish additional tools beyond LibQUAL+. Once
LibQUAL+ was established in its current standard form in 2003, there were efforts to bring into the new electronic environment the historical ARL Statistics. The ARL Statistics data were collected through web forms before and there was also an analytical interface housed at the University of Virginia. The development of the LibQUAL+ technical infrastructure afforded ARL to bring both the data management and the data publishing workflows under the same roof, the StatsQUAL gateway. While working on streamlining into StatsQUAL the internal statistics operations, a grant from the National Science Foundation allowed for the experimentation of the DigiQUAL protocol where valuable lessons were learned about how to approach the measurement of quality in virtual environments. For example, since that time we have seen commercial outfits like Foresee Results dominate the marketplace as well as the popular Google Analytics implementations on the low cost high return continuum. In the same line of trying to capture the value of the online environment, an effort was made to bring MINES for Libraries® (Measuring the Impact of Networked Electronic Services) into the StatsQUAL platform. MINES is still a dream to be scaled because the level of automation and diversification on the technology and assessment on campuses has not allowed for scaling this valuable protocol to the levels of LibQUAL+. Furthermore by 2009, the ClimateQUAL® protocol was brought to ARL by a new executive director, Charles Lowry, and solidified and supported further by a new Deputy Executive Director, Sue Baughman. The last and very promising set of activities that are now housed in the StatsQUAL platform include the LibValue set of activities, an effort to study outcomes, value and return on investment in collaboration with Carol Tenopir at the University of Tennessee and Paula Kaufman at the University of Illinois at Urbana-Champaign. So true to the notion that one size does not fit all, LibQUAL+ has supported the development of more than its own theory and practice, emphasizing both different designs, methods and tools.

Diverse Needs of faculty in ARL Research Libraries

Also, within LibQUAL+ itself we do note that a diversity of views is taking place among different user groups, students and faculty by examining trends for the LibQUAL+ ratings since 2003.2 Where we have seen more students being more interested in the library as space issues, we also see more faculty being increasingly more interested in the information control dimension).3 In this presentation we highlighted three different questions from the LibQUAL+ information control dimension, where research libraries are slowly improving the expectations gap as they slightly improve low ratings that are not meeting the faculty minimum expectation in some of the following areas: (a) the printed materials I need for my work (Figure 1); (b) print and or electronic journals I need for my work (Figure 2), and (c) a library website enabling me to locate information on my own (Figure 3). So, while libraries have indeed bridged the gap between minimum expectations and perceived ratings of quality when it comes to the print materials faculty need for their work, they are making progress when it comes to print/electronic journals but still fall short of meeting faculty minimum expectations.

Furthermore the gap may not be closing at all when it comes of a website presence that helps them locate information on their own (Figure 3). Clearly the web environment and the relation to digital library services and digital library assessment is a key area that needs to be investigated fully in the future.4 More work is needed in this area in the coming years!

—Copyright 2015 Martha Kyrillidou, Colleen Cook, Fred Heath, Steve Hiller, J. Stephen Town, and Bruce Thompson
Figure 1. The Printed Library Materials I Need for My Work - Faculty

Figure 2. Print and/or Electronic Journal Collections I Require for My Work
Figure 3.

Figure 3. A Library Website Enabling Me to Locate Information on My Own

References


Core Competencies for Librarians with Assessment Responsibilities

Susan Erickson
Virginia Wesleyan College, USA

Sarah Passonneau
Iowa State University, USA

Background
This study, conducted over the past two years, attempts to identify core competencies for assessment librarians and was undertaken as a research project for the Library Leadership and Management Association (LLAMA)’s Measurement, Assessment, and Evaluation Section (MAES). Job advertisements for a variety of assessment-related positions were reviewed to determine what skills and experience were included in the postings. LLAMA serves all library types, so public and special libraries were included, in addition to academic libraries, though the majority of job descriptions found were from academic libraries.

The LLAMA MAES Education Committee, formed in 2011, had as part of its charge to develop core competencies for assessment librarians. The research described was undertaken in response to this charge. In order to cast a wide net to capture a variety of assessment positions, the researchers reviewed six library job websites and Listservs over a period of 18 months. Search terms used were: assessment, evaluation, metrics, and strategic. The latter was included after the researchers began analyzing initial results and realized that many of the positions they were finding were aligned with strategic planning.

The researchers were particularly interested in following up with Walter and Oakleaf’s initial analysis of job postings, presented at LAC 2010,1 which posed the following questions:
1. Are academic libraries recruiting for assessment skills?
2. If they are, are they doing so in a meaningful way?

This research both complements and differs from Walter and Oakleaf’s in that it advances a similar line of inquiry but uncovers a common framework in assessment job postings that was not evident in the results of the previous study. The authors of this current study will argue that, contrary to the findings of previous research, a common culture of assessment seems to be shared within the library assessment community.

Methodology
The authors started their research by searching several library career websites and Listservs. A total of six library career sites were searched periodically over eighteen months. The websites included the American Library Association’s JobLIST site, as well as more specialized career sites, such as the ARL-ASSESS list.

Over the 18 months, the researchers found 231 job descriptions. These were analyzed using Atlas.ti, qualitative software that facilitates content analysis. The researchers developed 64 codes to identify the competencies. The codes were then analyzed for co-occurrences. From these co-occurrences, code families, super codes and subsequently, networks were developed. The networks provide a way of identifying common overarching themes in the competencies.

The jobs in the study fell into two major categories: (1) assessment librarian positions where the primary focus of the job was assessment; (2) jobs with assessment responsibilities (referred to by the researchers as “non-assessment” jobs), where the focus of the job was something else, such as metadata, instruction or administration, but where assessment, evaluation, measurement or metrics was referred to in the job descriptions.
For further detail of the research methodology, the authors refer readers to their article in Library Leadership & Management.

Conclusions
While the researchers found over forty “assessment librarian” positions, the variety of job titles found in the study suggests that assessment is becoming more pervasive throughout our organizations and is part of an evolving reconceptualization of staffing in libraries. All of the assessment librarian positions were in academic libraries and most were in Association of Research Libraries (ARL) member libraries.

Top skill areas included in the job descriptions are:
• Assessment tools
• Analysis/analyze data
• Collaboration
• Presentation
• Assessment methods
• Innovative/dynamic/creative
• Assessment program (long term development of a program of assessment)

The researchers found 187 job postings in the “non-assessment” category; 87% of these were from college/university libraries. Within this category, 30% of the positions were instruction-oriented, 20% were administrative positions (deans, directors, department heads) and 16% were in public services/reference. Instructional and administrative positions had more detailed assessment responsibilities.

The researchers noted the inclusion of assessment in newer job areas, such as “emerging technologies” and “digital collections,” as well as in more traditional job areas, such as archives, access services, and cataloging.

The researchers identified five overarching skill areas that were commonly included in the job descriptions in the study. These are listed in the addendum.

This research provides evidence of the advancement of a “culture of assessment” and can help guide librarians interested in assessment toward appropriate professional development opportunities. The core competencies can also serve as a guide for librarians faced with adding responsibilities for assessment into their existing positions. Finally, the competencies can guide library administrators and managers in the reshaping of existing positions and the creation of new positions to support assessment in their organizations.

Recommendations
This research dovetails with another recent research project from the LLAMA MAES Education Committee, in which Askew and Theodore-Shusta reviewed library and information science curricula to determine whether assessment skills were covered. They found only one formal course on assessment and just a few programs requiring research methods. If these skills are not covered in formal education programs, then we can assume that any skill development comes through on-the-job training; professional development in the form of short courses (ex. ARL Service Quality Academy); conferences, such as the Association of Research Libraries’ Library Assessment Conference; or through self-directed activity, such as reading journal articles and conference proceedings.

To address the gap between the core competencies needed to do assessment work in libraries and formal education programs for librarians, the researchers have several recommendations for the library assessment community:
• Librarians can use the core competencies identified through this research to identify gaps in their own skills.
• Assessment librarians, and others with significant assessment responsibilities, can use this research to advocate for support of their own professional development.
• Professional associations could identify gaps in professional development training.
• Associations or LIS programs could develop a certificate program in library assessment.

The researchers also have recommendations for LLAMA MAES:
• Reach out to the Public Library Association to more effectively research “assessment” in public libraries. The researchers in this study are from academic libraries and suspect that there may be differences in terminology or approaches that would explain why more positions were not found.
• Add existing professional development opportunities to its Assessment Toolbox to facilitate librarians locating programs that could address their own skill gaps.
• Reach out to LIS educators through the Association of Library and Information Science Educators (ALISE) to point out the gap and recommend skill areas that could be included in coursework to begin addressing it.

The good news is that assessment is being included in new and traditional positions. While it is gratifying to see the development of assessment librarian positions in ARL libraries, it is equally satisfying to see other job descriptions, including responsibilities for assessment.

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Endnotes


The following addendum was provided as a handout for “Core Competencies for Assessment Librarians,” Library Assessment Conference, 2014 and was previously published in Library Leadership & Management.
## ADDENDUM

### Five Knowledge and Skill Areas for Assessment Librarians

| 1. Background in Library Assessment | • Historical understanding of the growth of assessment in libraries  
• Historical overview of important librarians and past initiatives  
• Awareness of current national initiatives (LibQUAL+®, ROI, NSSE, IPEDS/NCES, Balanced Scorecard, Value of Academic Libraries, etc.)  
• Fluency with relevant library standards (e.g., ACRL Standards for Libraries in Higher Education)  
• Ability to identify resources to help develop skills and network (LLAMA MAES Assessment Toolbox, conferences, webinars, courses) |
|---|---|
| 2. Research Methods | • Social science research design (focus groups, unobtrusive methods, etc.)  
• Survey design (good construction, choosing rating scales, values, comment boxes)  
• Developing a good research question  
• Selecting the best method to answer the question  
• Knowledge of influential library assessment methods (EBLIP, SAILS, RAILS, etc.)  
• IRB training and ethical use of data |
| 3. Statistical and Analytic Skills | • Background on descriptive statistics  
• Introduction to basic statistical models (e.g., T-test) and when to use them  
• Understanding of quantitative and qualitative methodologies  
• Introduction to basic qualitative coding methods  
• Introduction to quantitative (SAS, SPSS) and qualitative (Atlas.ti, InVivo) software packages  
• Introduction to analytic tools (web analytics, learning analytics) |
| 4. Visualization and Presentation Skills | • Basic overview of graphic design rules  
• Overview of different chart types and when to use them  
• Visualization techniques to display qualitative data  
• Slide presentation skills  
• Basic overview of a good structural design (how to present a compelling narrative)  
• Basic overview of understanding your audience  
• Basic overview of good oral presentation habits (clear voice, general body language, hand movements, etc.) |
5. Project Management and People Skills

- Basic group dynamic theory
- Methods to increase collaboration
- Methods to manage data conflict (when different stakeholders want the assessment results to present divergent “stories”)
- Building capacity/buy-in for projects
- Team management skills
- Project management skills
- Methods to optimize creativity and productivity of a group

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Library Assessment and Quality Assurance: Creating a Staff-Driven and User-Focused Development Process

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Abstract
Library assessment and external intelligence is important for tracking and improving library activities. Quality assurance and strategic planning are intricate parts in sustainably developing better and more effective services.

Gothenburg University Library has implemented a process with the goal to join these activities. The process has both bottom-up and top-down features designed to generate strong staff involvement and long-term strategic stability.

In 2008, the library started implementing a system where each library team should state a number of improvement activities for the upcoming year. In order to focus the efforts, the system has gradually been improved by closely coupling a number of assessment activities, such as surveys and statistics. The results have generated increased understanding within the different staff groups for changing demands from the surroundings and the need for continuous change to our activities. To further focus the outcome, the process is now also closely guided by the long-term strategic plan of the library.

Background
Library management development requires continuous input of internal and external intelligence to be successful. Assessments and statistics are collected throughout the year. Research library statistics have been a part of the Swedish mandated national statistics since 1954. Locally this means that an impressive array of data is produced and conveyed to national authorities every year. Qualitative data come into play as patrons are regularly surveyed, introducing ideas and user perspective into the organization. In addition, a number of activities and projects rely on assessment results.

Quality assurance and strategic planning are important parts of systematic public management. For libraries it is not uncommon that these types of systems originate from the parent organization. The University of Gothenburg implemented a university wide quality assurance framework in 2001, and the library joined in 2004. A new strategic planning system has been in place since 2013. In addition, a number of fields (environment, worker’s and fire safety, etc.) have their own systems and auditing procedures to expand the picture.

All these tools are useful and valuable for improving and making our libraries more effective. On the other side, they can feel ill-coordinated and hard to communicate to the staff and stakeholders. Gothenburg University Library set out to condense the majority of these activities into one process. Effort was put into building a user-focused and staff-centered bottom-up process. Separately, the more long-term strategic cycle was complemented with staff input and statistical intelligence.

Building the Quality Cycle
In 2001, the University of Gothenburg board established a quality system framework. It mandated all university schools and the library to set up quality systems. The nature of the local quality systems was not described in detail but was left to the different schools to formulate, based on individual circumstances. Later, a system auditing procedure was put in place to give collegial advice on the development of the local systems.

The university library implemented its first quality system in 2003/2004, when a set of goals were defined and assessed throughout the organization. The system was then changed and improved in 2008 and 2012.
Describing the Quality Cycle

The process, as it is in effect now, is based on a follow-up/planning period in January/February of each year (Figure 1).

**Figure 1. Quality Cycle**

In the planning stage, each library team (5–12 staff), defines a few small projects (activities), which should be completed before the end of the year. These activities can be large or small in nature. The resulting activity plans are gathered from throughout the organization and published on the library intranet. To strengthen the strategic relevance, a number of activities are selected from the strategic plan by the university leadership and assigned to the individual teams prior to the planning. This means that each team may have one or two activities that must be included in the activity plan in order to keep pace with strategic goals.

To give the staff teams a good background for their work, the planning period is preceded by a follow-up and assessment period approximately one month before (Figure 2). During the follow-up, the activity plans from the previous year are accounted for. In addition, the teams should study and comment on data from a number of other sources. Each year has a follow-up theme. A centrally prepared assessment report is presented to the teams. Data is provided with the option to drill down to the team level. The latest user survey may be presented, or a report of improvement suggestions from staff or users. During this period the library overflows with staff discussions on why the visitor numbers are down, or why there are so many enquiries at the front desk regarding directions to the restrooms.
Building the Strategic Cycle

Some management activities are repeated less frequently than once a year. One of these is the development of the library strategic plan. A weakness in quality assurance work is that it does not necessarily make the library activities more focused or more effective. A long-term direction needs to be established.

The way to handle this problem was the creation of the Strategic Cycle (Figure 3). Early the year before a new strategic plan is set to take effect, external intelligence is gathered in a more deliberate way than normal. Vision statements and other long-term documents are revisited and revised. Later in the year, seminars and group discussions consolidate the material, and a new strategic plan is drafted. After approval—when the plan has taken effect—the quality cycle can be used to drive the implementation.
Figure 3. Strategic Cycle

Collection of Intelligence
Intelligence collection is key to the strategic cycle. One technique used is benchmarking, which has been done in a number of different constellations and themes. The ideal benchmark activity starts with a need, and then defines a number of themes of interest. Libraries are then scanned to see who is doing an especially good job in the selected area. Identified libraries are then contacted and invited to add themes of their own. The library leadership teams then meet altogether to present the activities within their libraries in the selected areas of interest. This often gives a richer understanding of the state-of-the-art activities in the areas selected.

The intelligence collection process preceding our latest strategic plan produced a trend cloud, which then was used to develop the plan (Figure 4).
Conclusions
Staff ownership of the quality and development processes has shown to have a number of positive effects. In spite of earlier internal communication efforts, change management is still a challenge. It is also hard to involve all staff in the formulation of decisions on a broader scale. Our work with quality and strategic cycles at Gothenburg University Library facilitates collective involvement of the whole organization to address the hardest issues in our changing library environment. As a result, many more are actively involved in the change processes. Everyone has an understanding of the developments and that they can make and be responsible for the changes in their immediate environment.

There is great benefit to including assessment results in systematic change processes. Many surveys and studies of statistical data have precipitated a large number of actions plans throughout the years, but the follow-up and implementation steps have been more difficult. Statistical data, especially the data collected for national statistics, has rarely been used for library development. The definition of a yearly process, into which data and previous findings can be funneled, has shown to be a powerful driving force for implementing meaningful change.

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Support System: Establishing, Sustaining, and Growing a Framework for Assessment

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Abstract
Academic libraries have been realizing the critical need for robust assessment strategies in their organizations, particularly as the way to demonstrate value continues to shift from collecting and reporting transactional data to determining what constitutes significant outcomes, meaningful impacts, and measures of student success. But in an era of constrained resources, many libraries are faced with the challenge of exploring ways to launch assessment initiatives with existing resources, redeploying staff, and/or forming committees. Such an approach can lead to uncertainty in roles and expectations, but with careful planning and effective collaboration, it can achieve a great deal as an aggregate method. In the two years since the Northwestern University Library (NUL) recast an existing position to include service assessment and formed an Assessment Committee, significant progress has been made toward establishing a library-wide culture of assessment.

Libraries of all shapes and sizes are in critical need of robust assessment strategies. Creating a path to allow the development of quality assessment and evaluation is an essential element of any strategy, and Northwestern University Library shows how this can be done. The evolution of assessment as an area of work and commitment of resource has been gradual but effective.

Northwestern University, founded in 1851, currently enrolls approximately 16,000 students (equal number of undergraduate and graduate) across three campuses—Evanston IL, Chicago, and now Doha, Qatar. The university is divided academically into 12 distinct schools, offering 124 undergraduate degrees and 145 graduate. Some 7,000 faculty and staff support the school’s teaching and research mission. The library is large—both in terms of collections and organization. Five library divisions employ 300 FTE employees, providing access to over 4.6 million titles and numerous online resources. Finally, the library’s physical plant consists of five aging buildings; the layout of each is hardly ideal for contemporary library use or housing library collections.

Recent years have seen the library establish an increasingly diverse array of priorities. With a growing outreach agenda, new services, new hires, incremental restructuring, and responsive renovation, the library finds its mission expanding rapidly. Recent priority shifts revealed a need to address assessment in a more robust and user-centered way. Assessment, as a range of activity, has been occurring in the library for a long time. However, with our newly perceived need came awareness that any successful assessment requires a better understanding of what assessment is and why it is important. All library staff must understand that assessment is critical for demonstrating the library’s value and its impact throughout the campus community and beyond. By cultivating a culture of assessment, the library was able to advance related goals. A strategy was developed to address assessment needs that consisted of redefining two existing librarian positions and establishing a library-wide committee with oversight responsibility in this area.

The first position created was the assessment librarian, living in the User Experience department but working across the library as a whole. Focus for the assessment librarian is centered on user needs and services and includes active engagement in patron studies and participatory design. In tandem with hiring the assessment librarian, the library assembled a committee to oversee assessment activity across all library units. The committee has 10 members who were invited to serve based on their interest or their previous assessment work. As the last component of the strategy, an additional position was reimagined to look at collections and other library-generated data. The newly
defined position is taking the lead in reporting data externally—for example, to ARL. Named the collection and organizational data (CODA) librarian, the initial vision is to concentrate on collections data, but eventually to expand to the consideration of other data sources.

Within this framework, a challenge that emerged was to define respective roles for the committee and both assessment librarians. The committee is to be involved as widely as possible, encouraging assessment in all library departments and engaging in most assessment projects either in an advisory capacity or through direct participation. As an example of engagement activity, the committee has now established the practice of holding biannual town hall meetings. The meetings have allowed the committee to gain valuable feedback, showcase successful assessment projects (most recently, via a poster session), and bring in speakers to address articulated needs, such as how to create effective surveys. Additionally, the committee has created a staff LAN to report assessment activity, and gathered information on staff skills related to gathering, reporting, and storing data.

The assessment librarian works across all library units to offer assistance in devising and executing assessment projects. Developing and sharing resources that can be used by all staff, such as an assessment LibGuide, is an essential responsibility. Reflecting the pan library approach, this position reports vertically as part of the Public Services Division as well as laterally to the committee as an ex officio member. The assessment librarian is a primary liaison with campus assessment partners, and works to raise the visibility and impact of library assessment efforts.

Taking more of an internally focused approach, the CODA librarian manages large data sets that inform assessment within the library, but a sample of data also is reported externally. Some of this work is in transition, and so is the exact role of the CODA librarian. The creation of the position alone reflects a shift away from focusing primarily on collections data to consider user experience trends.

The committee and the two librarians actively encourage a culture of assessment. We define this as a set of attitudes, approaches, and understandings that support the evaluation of student learning outcomes. A culture of assessment is alive and well in the ongoing work of all, and a complementary skillset is present in many library staff. A willingness to change, in tune with institutional goals, is becoming second nature.

In considering this model, it is important to make note of the milestones achieved. Following the initial perception of need, key library staff obtained administrative support to recast existing positions and create a new committee. On the landscape of shifting priorities, establishing support at the highest level was critical not only to being able to devote resources but also to creating a positive message for the library staff. The library’s ability to demonstrate value to campus partners is now seen as a key strategic priority.

In the library, assessment projects are now highlighted and serve as models of success with hope of inspiring others to engage in their own assessment activities. Good projects indicate how assessment is part of ongoing daily work. Since the committee’s inception, an ever increasing number of staff members are developing projects that involve or include an assessment component. There is a growing recognition of the need to evaluate our work. The success of a library having an impact on student learning outcomes can only be shown through assessment that is directly tied to individual or unit objectives. As more and more staff assess their work, the library will have a greater ability to demonstrate its value across the entire range of services and operations. With an increasing amount of assessment, and a growing awareness of the importance of assessment, the library increases its organizational capacity. This develops a feedback loop that will, in time, sustain and fuel a culture of assessment.

Reaching out to new partners on campus positioned the library to have a place in the campus’s assessment dialogue. As we strengthen these relationships, we will not only fortify our own ability to conduct assessment, but also become a more vital resource. While libraries are not the sole owners of assessment in higher education, we are easily seen as important peers who are ready and willing to contribute.

As the assessment librarians and the committee advance the cause of assessment at Northwestern’s library, some things have become clear. We have identified the need to speak broadly to campus
partners and beyond and have gained a better understanding of how to do so. We have realized that assessment is an ongoing process. Successful assessment can lead to change, or to an informed decision to make no change. It can answer some questions, but just as likely create new ones. Our own work does not live in isolation, and neither does assessment.

A critical component of building a culture of assessment and expanding organizational capacity is to routinely highlight good assessment activity. Nothing is more informative and inspiring than to learn how the work of a trusted colleague is made better through assessment. For some, knowing good assessment is seeing it.

The point of assessment, which can be lost, is to make evidence-based evaluations. Methods, examples, strategies, and skill sets can easily obfuscate the fact that what we are doing when we assess is gathering information that will inform our understanding of success or failure. Assessment itself makes no evaluation, and assessment practices should always be focused on the goal of making determinations. Assessment for the sake of assessment is not assessment at all.

By including users in the assessment of important library services, like space enhancement or website design, the library can more easily build user-centered services and facilities. As an adjunct result, users will feel more ownership of and responsibility toward the library.

Finally, it is essential for the library to develop fluency with both qualitative and quantitate evidence. Each offers strengths that, when well understood, can be leveraged in different settings depending on need. What tells the library’s story in the most effective way in one instance may not work at all in another. Developing skills using both kinds of evidence is essential.

As the Northwestern University Library continues to grow its assessment agenda, this model may change. What is hoped is that the creation of an approach will allow staff to learn about assessment, obtain the necessary resources, and become experts in telling the library’s story as part of a campus dialogue about teaching and learning.

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Collaborating with Faculty to Assess Undergraduate Information Literacy in Degree Programs

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Most student learning related to information literacy competencies takes place outside the library: for example, during class discussions, in laboratory preparations, and in the course of completing papers, projects, and presentations. According to the Association of College and Research Library’s Information Literacy Competency Standards for Higher Education, “Incorporating information literacy across curricula, in all programs and services, and throughout the administrative life of the university, requires the collaborative efforts of faculty, librarians, and administrators.” Thus, it follows that assessing information literacy across curricula also requires the collaboration of faculty and administrators.

Librarians initiated this project to demonstrate ways of assessing information literacy within diverse disciplinary contexts across the undergraduate curriculum. Because information literacy competencies take different forms in different disciplines, they recruited faculty participants from undergraduate programs in four broadly-defined groups, reflecting the overall composition of Duquesne University: the humanities, professions, sciences, and social sciences. The project’s goals were: (1) document models of assessing information literacy relevant to a wide array of academic programs; (2) develop evidence of practice that would serve as a “proof of concept”; and (3) promote faculty collaborations to assess information literacy throughout the undergraduate curriculum.

This project took place in 2013 at Duquesne University, a Catholic university located in downtown Pittsburgh, with approximately 10,000 students and ten schools. Gumberg Library is the primary library for all except the school of law, which is served by its own library.

Methodology
Because each of the librarians was serving with other faculty members as co-chairs of the university learning outcomes assessment and information literacy committees, they were well positioned to propose the project to the associate provost for academic affairs. The associate provost agreed to fund the proposal as a summer project and provided stipends for faculty participants. After consulting with faculty, deans, librarians, and the faculty development director, the librarians identified and recruited faculty participants from the biological sciences, English, and psychology departments as well as the school of nursing. Shortly before the start of the project, the nursing faculty participant accepted a position at another university. Therefore, the project moved forward assessing the undergraduate programs in the biological sciences, English, and psychology departments.

The faculty participants agreed to: (1) identify program level information literacy goals for each of their programs; (2) map discipline-specific terminology and competencies to the university’s definition of information literacy; (3) review syllabi to create curriculum maps documenting course-level information literacy learning outcomes and assessment; (4) provide evidence of analysis of assessment results and plans for subsequent use to
improve learning; and (5) present their findings at a workshop open to all university faculty.

The librarians created a LibGuide designed to help the faculty participants quickly locate the university information literacy definition and assessment guidelines, regional accreditation standards and definitions, and other library resources about information literacy. The guide also provided sample curriculum maps from varied academic programs as well as further readings about curriculum mapping. The librarians periodically met with participants individually to guide their work, answer questions, and review report drafts. The faculty participants submitted the final reports to their departments, the library, and the associate provost.

Findings
Faculty participants discovered gaps in the information provided in course syllabi, particularly the lack of explicit information literacy learning outcomes. Each faculty participant also encountered distinct challenges and opportunities. For example, when one faculty participant experienced a lack of cooperation from her colleagues when they were not forthcoming in sharing their syllabi, she tried creating an online survey. Many of her colleagues were willing to respond to the survey rather than provide their syllabi. Because another participant received the support of her chairperson, she was able to review all the syllabi. Since her department has a heavy teaching load in the core curriculum, she focused her analysis on the major level courses. The final participant served as the director of her department’s undergraduate program, and was able to access syllabi and other files as needed.

In general, the faculty participants confirmed that most key information literacy objectives were covered within their curricula. However, they did have some interesting and divergent findings.

One faculty participant found that information literacy competencies are taught and assessed frequently throughout her program; however, she discovered two significant gaps that she intended to address:
- While creating the program course map, she discovered that the major level courses did not explicitly address academic integrity issues, such as plagiarism, copyright, and ethical use of information. With further investigation, she discovered that department faculty had assumed that this material was sufficiently covered in the Duquesne University Core Curriculum. She concluded that the department should consider further developing its efforts to teach the importance of academic integrity and responsible use of information at all levels.
- She also found that scaffolding assignments (designed to help students structure their research, evaluate sources, and prepare research papers) were frequently used in introductory and capstone courses, but infrequently used in midlevel courses. She suggested that the department reinforce skills taught in bibliography assignments, such as accessing and evaluating information, throughout all levels of the major.

Another faculty participant found that all of Duquesne’s information literacy competencies were addressed but learned that the “formulating information needs,” “accessing information,” and “evaluating information sources” competencies did not appear to be as well covered as the others. This finding surprised and disappointed her because she considers these three competencies critical in her discipline. At the time she filed her report, she noted as a possible explanation that faculty members covered but did not explicitly mention these competencies in their syllabi. This finding presents an opportunity for follow-up discussion and could lead to clearer documentation of information literacy learning outcomes in department syllabi.

Different Interpretation of Competencies
Although the university’s definition of information literacy is based on the definitions of its regional accrediting agency and the Association of College and Research Libraries, the faculty participants’ understanding of some of the competencies differed significantly across disciplines.

Faculty participants had widely divergent interpretations of the competency: “Use information effectively to accomplish a specific purpose.” To the librarian authors, this concept seemed to be very clear and straightforward. Thus, they were surprised that two of the three faculty participants requested a further explanation of the competency. This competency immediately
The faculty participant from English and psychology needed to give serious thought to how this competency applied in their disciplines. The psychology department participant was able to integrate the competency into her reporting and assessment. However, the faculty member representing the English department noted that using “information effectively to accomplish a specific purpose” was not representative of how her colleagues viewed information resources. She noted that their typical approach is engaging in close readings of texts and analyzing them. However, she acknowledged that the competency described how English majors might interact with secondary sources, which is just one part of their learning.

Practical Implications
This project demonstrated that information literacy learning outcomes are addressed within the undergraduate curricula of participating academic programs, and encouraged further assessment of information literacy at the course and program level. Faculty participants documented the extent to which the university’s information literacy definition fit their programs’ learning goals. The curriculum maps they created have the potential to serve as mapping models for other programs in the humanities, sciences, and social sciences. The three participants presented their findings at a workshop open to all campus faculty members and sponsored by the faculty development center. Judging from workshop participants’ discussion, the authors believed that the biological sciences and psychology methodologies produced usable models for many Duquesne University professional programs. For example, after attending this workshop, the English as a Second Language (ESL) faculty approached the library to incorporate information literacy throughout the ESL curriculum.

It is also interesting to note that although the project presenters represented both the sciences and humanities, the workshop attendees were mostly faculty members from professional programs. One possible explanation is that faculty in these disciplines are already accustomed to assessing their programs through the lens of a set of competencies or standards. In their roles as committee co-chairs, the librarian authors have observed that faculty in professional programs are generally more supportive of assessment efforts than other faculty.

All three faculty participants planned to discuss their findings, review the curriculum maps, and address gaps identified through curriculum mapping with their whole departments at the start of the fall semester. In the case of the English and psychology departments, the participants also decided to use the results to inform planning for senior capstone projects.

This low cost project helped faculty participants align their program learning goals with the university’s information literacy expectations. They discovered curricular strengths and gaps and used their findings to better integrate information literacy into their programs. Through the voices and experience of three faculty colleagues, the project enabled additional faculty members to appreciate that information literacy is a key learning goal for the whole university. The project offers an easily adaptable model for using librarian/faculty collaboration to promote mapping information literacy competencies, instruction, and assessment planning into undergraduate program learning goals. Additionally, this approach strengthens working relationships between program faculty and librarians while providing actionable assessment evidence for academic programs and the library.

Recommendations
In addition to the information literacy assessment findings, we made several interesting observations regarding the management of a project that includes diverse disciplinary faculty members. Based on those observations, we are suggesting the following recommendations:

Choose faculty participants strategically. Faculty members working on this type of project either need to be in a position to act upon their findings or to motivate others in the department to act on the findings. Additionally, they need to be seen by their colleagues as being with the department’s mainstream. If the faculty member is viewed as outside the department’s mainstream,
it will give some departmental colleagues the opportunity to dismiss the results as irrelevant.

**Include multiple incentives for faculty participation.** In order to motivate faculty to participate in a labor-intensive project of this sort, there need to be clearly defined wins for the faculty participants beyond the stipends. Some examples include: improving program learning outcomes, scholarship of teaching and learning, and formal recognition of their efforts (e.g., letters for portfolios).

**Build checks and balances into the process.** Most faculty members are highly motivated, and when they “get” information literacy and assessment, the quality of their work is outstanding and requires minimal guidance and encouragement. When the faculty member does not “get it,” they may not able to accomplish the project’s objectives regardless of the guidance available to them. Helping faculty members translate information literacy concepts into the vocabulary and teaching practices of their disciplines is a key contribution of librarian collaborators.

**Create a project timeline that includes progress meetings.** Scheduling meetings to keep the faculty participants on track provides invaluable opportunities for faculty to learn about assessing information literacy while librarians learn how faculty in academic programs integrate information literacy into their curricula.

**Make sure to close the assessment loop.** Expectations for faculty participation should include closing the assessment loop. Some possible approaches include: reporting findings to department chairs and faculty, describing changes made due to assessment results, and including the project assessment report in the department’s university required assessment reports.

**Avoid the “once and done” mindset.** The benefits of the project will be most effective if the project is recurring. If it is funded annually, then the university can build up a “critical mass” of faculty who recognize the importance of assessing information literacy.

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2. Duquesne University, *Definition of information literacy* (2013), [http://www.duq.edu/about/administration/academic-affairs/policies-and-procedures](http://www.duq.edu/about/administration/academic-affairs/policies-and-procedures). The Duquesne University definition of information literacy lists the following competencies: “An information literate individual can: (1) determine the nature and extent of information needed; (2) access needed information effectively and efficiently; (3) evaluate information and its sources critically; (4) integrate relevant information into one’s knowledge framework; (5) use information effectively to accomplish a specific purpose; (6) access and use information ethically and legally, respecting Duquesne’s Academic Integrity Policy and the University’s mission; and (7) understand economic, legal and social implications regarding the principled use of information.”


4. ACRL.
The Role of Student Advisory Boards in Assessment

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ABSTRACT

A student advisory board can become a unique addition to an academic library's assessment program. Student advisory boards can exist to give academic libraries feedback and information on user perceptions and experiences, strategic guidance, suggestions/ideas for new or improved services, facilities, and resources, comments, or complaints; and responses to library proposals for new resources, programs, services, or improvements. This presentation addressed some of the benefits of advisory boards for libraries, as well as procedures for maintaining successful student advisory boards at three different institutions, and most importantly, using the information received to enhance or enrich information for assessment.

A student advisory board can become a unique addition to an academic library’s assessment program. Many for-profit organizations have consumer advisory boards, not only to enhance public relations, but for the direct information board members provide to develop better products and services. Student and faculty advisory boards can exist to give academic libraries feedback and information on user perceptions and experiences, strategic guidance, suggestions/ideas for new or improved services, facilities, and resources, comments, or complaints; and responses to library proposals for new resources, programs, services, or improvements. Each of the presenters’ institutions has experienced the benefits of receiving information from a dynamic group of loyal and committed student board members. This presentation addressed the benefits of advisory boards for libraries, as well as procedures for maintaining successful user advisory boards at three different institutions, and most importantly, using the information received to enhance or enrich information for assessment.

The idea of an advisory board did not originate with libraries. Corporations and nonprofit organizations make use of advisory boards in a variety of ways. Corporations may test a completely new strategy or marketing campaign, letting the board members react. By giving board members a sneak peak at new ideas, corporations make them feel vested in the success of these initiatives and can get excellent feedback. Consumer panels or boards can react to products and services, as well as to the overall experience of shopping with or dealing with the organization. Nonprofits can get advice on the community environment, and get help with fundraising and lobbying from board members.

There are other groups, boards, and committees that can give feedback to the library, but this presentation does not deal with them. For example, many academic libraries have a group appointed by the provost or by the Faculty Senate. These groups can provide varying levels of oversight on the library’s strategic directors and can be part of the institution’s governance, much as a board can be part of the governance for a public library. Fundraising advocacy is a different kind of group; they can help the library tell its most positive story to people of influence. Friends groups emphasize public relations, community building, and
programming. Task forces and committees from the institution can have an impact on the library’s future direction and daily operations. While the library can receive feedback from all of these groups, none of them are designed to give the kind of direct, “on the ground” reports that users of the facilities, resources and services can.

Library decisions on the structure and operation of the board can determine the types of feedback and information that the board delivers. The purpose of its board, campus culture, tradition, and practices can dictate the formality—or informality—of advisory board establishment or initiation, recruitment of members, and board composition. While different at each institution, these are vital pieces of the long-term success of these three boards. The relationship of the board to library leaders and administrators as members or as sometime guests at meetings needs to be considered. Boards present library leadership with the opportunity for direct, face-to-face interaction with an important group of stakeholders, but student members should not feel outnumbered at meetings by library managers and administrators. Frequency of meetings and the meeting agenda are crucial as well in sustaining member enthusiasm and in generating informative discussion.

One characteristic that makes student advisory boards unique is synergy. When the library surveys students, or interviews them, it receives individual feedback that is not influenced by the presence of others. Even focus groups, although they certainly gain from the right group dynamic, are a group of individuals brought together on that occasion for that specific purpose. In contrast, student advisory board members become acquainted with each other over a period of time. While they are individuals—different majors, diverse backgrounds—they have homogeneity as students of the same institution, users of the same library, the same services and resources. The synergy created by board membership can provide the library with unique information. In the best of circumstances, they can become a team—a team that supports the library. Demonstrating to the student advisory board that they are special and important can help create the unique synergy that lets them feel free to give the library open, honest, constructive feedback. As members become more comfortable with library administrators, the synergy will result in more honest, open, and caring conversation about the library.

To create an environment for this kind of feedback, take a look at the culture of the campus and determine how you will appoint members. Receiving an appointment (and being able to put that on a résumé) is important to students. Student government and student organizations can help you recruit, or you can ask them for a representative for the board. Faculty and administrators can suggest student members. Librarians can suggest student members. At Georgia Tech, particular attention is paid to the composition of the board in terms of engineers versus non-engineers. Seventy percent of the student body are engineers.

It is important that board members know how often they will meet; it could be once each semester or could be more times. Sometimes students can be recruited from groups that are known to produce responsible students, such as scholarship winners, which gives the library a group of committed, hard-working students. Send out notes or minutes from the previous meetings with the invitation to the next meeting, along with the agenda. Always have food and try to have it a little better than the library’s “usual.” If the library has a special boardroom, that is where the meetings should be held. Listen as if every word the student members utter is golden. Try to give students some new information ahead of announcements: new service, new furniture, etc.

Several examples of the role of board-gathered information and activities in enhancing the assessment process are included from each institution. One of assessment’s claims to fame is that it closes the loop: that is, it gets information from patrons, analyzes it, acts on it, and communicates the change back to the users. Users feel that the library values their needs and perceptions. A student advisory board can produce comments and feedback, and with library decision makers present, a change can be made quickly, and reported back quickly. An example: at the University of Central Florida, a board member complained about viewing the local cable news station in the area near the coffee service, claiming it was nothing better than a crime blotter—a litany of robberies, car-jackings, etc. He initially suggested the BBC, but the board discussion led to broadcasting a national news station (all closed-captioned of course). Favorable student commentary followed the change: the loop was closed. It shows the board members that they have
some “power.” Their opinions are important even on small matters.

At the University of Louisville, the board has proven very useful in physical improvement projects and in web usability studies. Members serve as a built-in focus group, or sounding board, for feedback on small or large facilities changes. They have been part of charrettes for planning construction.

At Georgia Tech, student board members have contributed to piecemeal furniture moves to improve their learning environment, to the purchase of permanent seating in the rotunda (that followed a simple question: “Why aren’t there seats in the rotunda?”). The rotunda has now become one of the most popular places on campus.

Library administration can provide an overview on facilities and services, and student advocates can take it upon themselves to present that information to campus administrators. At Georgia Tech, student Board members who were well-connected to campus administration wrote a letter, independent of the library, asking the institute’s administration to address the issue of the library building’s condition. It is worth noting that if advocacy is not handled correctly, it can become an ethical issue: i.e., the library administration cannot ask board members to write a letter on behalf of the library.

At UCF, advisory board members have tested some survey questions and material. Reviewing survey results with students can generate further discussion and information gathering and can “translate” survey commentary in different ways. Publicizing results and inviting participation in assessment efforts can be challenging, and board members can make valuable suggestions. Boards offer a unique opportunity for students to communicate with the library, and for the library to communicate with students. Actions resulting from discussion at meetings must be communicated back to the students.

All three institutions have received valuable assessment information from student and faculty advisory boards. The input has been used to trigger additional evaluation and assessment of programs, services, or resources as an indicator of areas that need a quick fix or a longer-term solution, and to focus on trends in campus life that affect use of the library. In all three libraries, insight gained from board members has resulted in positive improvements. Board members can be surveyed between meetings. They can act as a test group for a survey or for questions and topics for focus group and other qualitative research. Minutes and feedback to board members ensure their continued engagement with the library.

Perhaps the most gratifying experience that each institution has had with its board is witnessing the conversion of appointed board members to active advocates for the library on campus. Advocates can help close the assessment loop by supporting the programs and enhancements suggested by assessment results, through invaluable word-of-mouth publicity and through support of campus funding initiatives that would enable these improvements.

Boards are not a shortcut to obtaining qualitative assessment information. If done well, everything takes time: recruiting the right students, preparing agendas, distributing minutes. It is only one tool in an assessment portfolio.

Our students can inspire us. The unique relationship fostered by the advisory board environment enables libraries to use this feedback to confirm what we have learned from surveys, focus groups, observations, etc. Or it can enable us to refine our methods of obtaining information. Or it can cause us to view information we have collected in a different way.

The library student advisory board is a small but time-consuming part of an effective assessment plan.

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Impacts of Different Types of Administrative Experiences on Performance Measurement Resource Support in Libraries

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The purpose of this study was to determine whether previous administrative work experience impacted the amount and types of resource support provided by head library administrators in conducting performance measurement activities in their libraries. The theory examined by the researcher was that library administrators who had previous administrative work experience before becoming a library administrator may support their library’s performance measurement processes differently than those library administrators who had no previous experience. For example, those with the additional administrative work experience may perceive a higher value of effectively supporting the performance measurement process than those with no previous administrative experience which is common among library administrators. Understanding any relationship between a library administrator’s previous administrative experiences and their resource support of performance measurement processes would aid library administrations and assessment coordinators in aligning resource support more effectively for the library’s performance measurement processes. The study design consisted of a survey administered in a state-wide census of library administrators from two-year and four-year academic libraries (including both public and private institutions) and public libraries (including both stand alone and collaborative systems). Participants were engaged to provide data related to their professional administrative experiences and the amounts of resource support they provided in conducting performance assessment in their libraries, including financial resources, staff work time, and their own work time. Research questions included: Does previous administrative work experience impact the support provided to a library’s performance measurement processes? Does the type of library a head library administrator works in at present impact the support provided to a library’s performance measurement processes?

The study design used a survey tool to conduct a statewide census of head library administrators to address the study questions. The survey was designed and implemented using online web survey software to distribute the survey to the study population and record their responses. Quantitative data was analyzed using descriptive and inferential statistics. After researcher analysis was completed, the data findings were submitted for independent statistical review for result confirmation, survey design and reliability coefficient, later calculated at .98. Outside review confirmed the researcher’s findings and conclusions. The study population consisted of approximately 180 participants and obtained a 49% participation rate, reflecting an equal distribution of library administrators by library types and the demographics of the study population. An analysis of collected data resulted in the following findings:

• The type (non-profit, for-profit, government) and/or duration of previous administrative experiences possessed by a head library administrator has no statistical relationship to the amount of resources support provided to performance measurement processes.
• The type of library that a head library administrator works in has no statistical relationship to the amount of resources support provided to performance measurement processes.

The average head library administrator provides the following annually to support performance measurement processes in their libraries: less than 5% of total staff time (based on a 40 hour work week) annually, less than 1% of operating expenditure annually, and less than 5% of the head library administrator’s work time (based on a 40 hour work week) annually. The average library may expend more on toilet paper and cleaning supplies than in expenditure support of performance measurement processes annually. The less resource support provided by the head library administrator, the higher the perceived expectation of results.
of performance measurement is by the head
library administrator. —Copyright 2015 Larry Nash White
Creating and Sustaining a Pool of Participants for Focus Groups

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Abstract
Traditionally, securing appropriate participants for focus groups at Washington University Libraries has been a time consuming and difficult job for library staff. This often discouraged them from using these assessment tools on all but the most high profile projects. The challenges in recruiting sometimes led to overreliance on “friends of the library” and on library student workers. The solution we chose is to create a pool of prequalified volunteers that can be tapped as needed. This paper explains the thought process used to develop the pool, as well as the methodology employed, and lessons learned in the start-up.

Traditionally, securing appropriate participants for focus groups at Washington University Libraries has been a time consuming and difficult job for library staff. This often discouraged them from using these assessment tools on all but the most high profile projects. The challenges in recruiting sometimes led to overreliance on “friends of the library” and on library student workers.

In the spring of 2013 members of the Libraries Assessment Team and the Emerging Technology Team brainstormed ways that we could improve the ease of recruiting by creating a pool of prequalified volunteers that can be tapped as needed.

The first step taken was a sweep of current library and business literature to see what has been written concerning methods of recruiting participants for focus groups and usability sessions. While there is a rich body of material available describing focus group best practices, Goodman, Kuniavsky, and Moed were the only authors we found who spoke directly to the process of keeping track of people available for recruiting:

However you connect with potential research participants, you should keep a database of people who are willing to have you contact them directly for user research. Be sure to record how you got in touch with each person. You should also keep a list of people who have asked not to be contacted, so that you can make sure not to bother them... You should try to have at least ten times as many people in your contact list as you expect to invite to your next round of research.1

The process or methodology we used to build the pool of volunteers was fairly simple. Members of the Assessment Team (with support of the Emerging Technology Team), reviewed focus group and usability activities from the past several years as well as upcoming projects in order to map out broad target user groups for building a pool. They determined that over the past four years the libraries ran an average of about 4–6 focus groups, plus 1–2 usability tests each year.

The resulting categories included faculty, graduate, and undergraduate students, with further segmentation by school affiliation. These breakdowns were considered the minimum needed for most of the sessions the library hosts. They were not the only categories used in focus group or usability sessions. For instance, a typical focus group recruiting profile might include more specific demographics (year in school, gender, etc.). It also might include the degree or type of library interaction, such as online, physically in the building, off campus versus on campus, and so on. However, to make the design of the pool more manageable, the “least common denominator” for information stored in the volunteer pool was faculty, graduate, or undergrad designations. It is also important to note that the volunteer pool is not expected to be the only approach to recruiting. The use of flyers, requesting recommendations from deans, and asking for volunteers in our foyer or coffee shop, are also valuable sources of candidates for assessment.

The next step in creating the pool was to set up an Excel worksheet, stored on our intranet to hold the volunteer data. Information included:
One of the most important elements of sustainability was developing a strategy for “feeding the pool.” User-facing library staff members were asked to participate in brainstorming. Five suggested strategies emerged from this discussion. First, a question was added to the Service Quality Survey inviting participation in focus groups. Second, at our fall Faculty and Graduate Student Orientation session, participants filled out comment cards which also invited them to be volunteers in future discussion to improve the libraries. Third, it was suggested that library instruction classes with exit surveys were asked to add a request for volunteers. The first target suggested was the Writing 1 course, which is required of all freshmen. Fourth, it was suggested that we create a form inviting students and faculty to join our pool of volunteers. This form could be posted on research guides on LibGuides, on the website, as well as in social media such as Facebook and Twitter. Fifth, all employees were to be encouraged to “feed the pool” by personally inviting anyone who they thought would be interested. As of August of 2014, volunteer participants have been collected from the Service Quality Survey, faculty and graduate student orientation sessions, and through occasional volunteers who were supplied by library staff.

The pool as of October 28, 2014 reached a total of 364 volunteers. The Service Quality Survey netted 340 volunteers, while the faculty and graduate orientations provided 23 additional volunteers in fall of 2013 and an additional 14 graduate students from the fall 2014 orientation. As mentioned earlier, the rule of thumb is to have a pool with about 10 times the number of contacts you plan to invite to your next session. At this point, the faculty and graduate student segments of the pool are covered, but we have more work to do to build the volume of undergraduate volunteers. This should improve when we begin asking for volunteers via the Writing 1 classes.

Access to the pool is managed through the Assessment Team. Staff already request support from the team using an “Assessment Activity Form”; once the staff sponsor of an assessment determines the target audience, the Assessment Coordinator (or designated team member) releases the names to the project manager. Depending on the experience level of the receiving manager, additional help from the Assessment Team is offered, including finding a facilitator, developing the communication, support for analysis, etc.

At the time of the Library Assessment Conference, the pool had been accessed for two projects. One of the suggestions from the project managers was that we should provide a chart (or Excel spreadsheet) with the information they are required to track and return. This results in easier tracking and reporting, and ensures that we honor anyone who may have asked to be removed from the list.

**Lessons learned—moving forward**

The work of maintaining the spreadsheet is not onerous, but it does take attention. Updating the spreadsheet after the project is completed usually takes about 15–20 minutes. Someone needs to be assigned to keep it up to date and responsive to user requests, or in our experience it will float indefinitely. It is also important to think about how we are asking for the data. Invitations to participate in the pool need to be clear and ask for complete information in a consistent format. For the Service Quality Survey we asked: “Would you be willing to participate in small group sessions exploring library related issues?” This wording allows us to tap volunteers for focus groups, usability training, or even informal discussion sessions. The response form collected name and e-mail addresses. Because of the survey demographics, we could separate faculty from graduate and undergraduate students. Unfortunately, in another survey we asked only for e-mail addresses, and not names. This makes it much harder to communicate when you are not sure what to call them in the invitation. Perhaps the most important reminder is that if you bother to collect this information, you should use it. People offered to help for a reason, and it is a waste of time and disrespectful if we do not take advantage of the support.

Looking forward, we also considered how we could use this rich information pool in different contexts. A natural extension is to use it with other types
of assessment, including interviews and usability testing. We are also participants in a university wide organization called CAUSE (Committee for the Assessment of the Undergraduate Student Experience). Interest has been expressed in exploring ways to adapt the approach to serve staff units outside the libraries, such as Student Services. Another bonus from the development of this database is as a complement to current faculty, graduate student, and undergrad advisory groups for the library. Not only does the spreadsheet increase the number of users we can tap, it also becomes a possible source of future advisory council members.

Creating a pool of volunteers has turned out to be an excellent way to leverage our existing interaction with users via surveys, at orientation and workshops, in classes, and even at the help desk. It sets the tone with users, reminding them that we care what they think, and that we are actively seeking feedback on the library services and space.

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Notes

Resources


Creating a Culture of Evidence and Assessment: Building a Daily Practice that Matters

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Abstract
Our reference department shifted data keeping from counting outputs to compiling robust qualitative and quantitative evidence. We designed a new database that could be used for both on-the-fly decision making and deeper assessment and annual reporting. We conducted several kinds of content analysis of the questions, such as applying basic typologies and analyzing the expertise required to answer questions. We discovered that qualitative data was able to inform a much wider range of practice.

We were able to identify bottlenecks students encounter while navigating library research. This information was used to make changes to our website, implement a citation finder tool, create online help guides, conduct more targeted outreach and library programming, and even approach faculty when data suggested an assignment could be modified to improve student learning. The “expertise analysis” enabled us to modify our staffing at the research help desk, incorporating different levels of staff (from student workers to subject librarians) as need demanded.

Lightning Talk
Despite understanding the importance of assessment in decision making, many academic librarians are resistant to it. In some cases, assessment can seem like an extra burden to gather evidence only for the purpose of accountability, rather than improvement. Some view assessment as data collection without an identifiable purpose or use. Assessment projects are often large-scale, requiring time and sophisticated data analysis methods and skills. In this context, assessment can become isolated, intimidating, and removed from the regular workflow and daily decision making processes.

At Cline Library, we have many of the positive elements of an assessment culture, including an assessment coordinator, university-level assessment requirements, and a user-centered philosophy. However, even with these elements, assessment was not a part of daily practice. It was often viewed as a large-scale, “one-off” type of activity, and many aspects of our services were consistently unexamined. Our research help/reference services provide a telling case. The library had traditionally used a simple tally sheet to monitor service activity. While this provided general traffic trends that helped determine hours and staffing levels, it did not provide the kind of qualitative data we needed to assess service quality, determine user needs, or address areas of improvement. This gap in our knowledge became evident when the library began to question the value of a separate research help desk and a tiered staffing model, using students for the frontline and referring complex questions to librarians, for an increasingly busy chat service.

As basic counting no longer sufficed for decision making, we decided to collect actual users’ questions. We used Springshare’s LibAnalytics to build a simple database of user queries. This enabled us to identify common user problems and barriers to effective library use, make staffing decisions, and develop a knowledge base for training and service improvement (see Appendix).

We began to see the effects of this change almost immediately. While there was some trepidation about the workload involved in recording questions, buy-in happened within the first few weeks. Staff working the research/help desk reported that the new data recording did not take much extra time and that they could see the value in the informal knowledge base right away. Staff also sent feedback on additional information to capture, such as the course number and faculty name for difficult or problematic assignments. This data was then given to the subject librarian to learn more about the assignment and advocate for improvement in the future.
Because the data was so rich and varied, we decided that the dataset should be completely open for staff to explore and identify trends. Staff were encouraged to suggest changes or solutions, large or small, to improve the user experience. We emphasized ongoing data analysis, and encouraged staff to not wait for the end of a semester to bring forth ideas. When building our database, we knew that this data could be used for various types of assessments from daily short-term decisions to in-depth assessments.

Short Term Assessment
Librarians noticed that there were many questions in which students had citations to articles but were unable to find them on their own via the library website. Through a quick examination of the data we determined that this was true. During the initial part of the semester, nearly 10% of questions were for finding known articles. We hypothesized that this was because there was no simple path or instructions for this type of search on the library’s website. Users would have to know to search for the title of the journal in the library catalog or e-journal search and then navigate to a specific volume. As a solution we piloted the Citation Linker feature in Serials Solutions for a short period.

We reexamined our dataset, combined with data from Google Analytics, to see if users were utilizing Citation Linker. We still received a large percentage of known article questions and few clicks on the Citation Linker. This suggested to us that the Citation Linker feature was not visible to the user. We advocated for making Citation Linker more prominent as part of revisions to the library website. We are currently analyzing the data to see if this solution is helping users. This initial example highlighted how we used data from our daily data collection in collaboration with other sources to assess the effectiveness of our library website. This small data-informed decision helped staff see the value of a more intensive data collection effort.

Medium Term Assessment
We also conducted a more detailed analysis of the data to inform a library-wide evaluation of our service and staffing model. Previously, the library had moved from a single reference/circulation desk to a separate research/help and main desk. In addition, the library opened a new service point in a technology-rich multimedia “studio” environment. A group was tasked to assess whether the existing staffing of the various service points was meeting users’ needs.

Using the READ (Reference Effort Assessment Data) scale two librarians classified a sample of 125 questions from the 2013–2014 academic year to determine the level of expertise required to answer each question. Using Krippendorf’s alpha for ordinal data, the coders reached a very good level of inter-rater reliability (0.719). The coders discussed areas of disagreement to reach further consensus. One coder then analyzed the remaining sample of data (eight weeks total from fall and spring semesters).

The results of this analysis suggested that most questions required a moderate amount of reference expertise, with some exceptions during busy research assignment times in the middle of the semester. The library used this analysis to shift staffing from a “just-in-case” model to “just-in-time.” Instead of staffing a low-traffic reference desk, librarians are now on-call in the building and available for in-depth consultations using a new appointment model. The goal is to build a service with a stronger educational component, rather than providing a few quick articles for assignment success. We plan to use the research help question dataset to see whether we are meeting this goal and we hope to link this data to assessments of student learning to see if more in-depth consultations contribute to student success and learning.

Using the same qualitative methods as outlined above, we also analyzed chat transcripts. For a number of years we have used an operator model for staffing chat. A student monitored incoming chats and then forwarded research questions to a reference librarian. Our analysis suggested that some students and staff were not referring questions effectively, sometimes trying to answer questions and realizing that they were more complex than initially anticipated. Our analysis of the data suggested that users were often being referred unnecessarily and that a large proportion of the questions required moderate to advanced reference skills. As part of the service model revision, reference librarians now monitor chat and immediately pick up research questions.

Long Term Assessment
Finally, we’ve used this dataset as a starting point to identify and confirm common learning
bottlenecks, as well as faculty approaches to information requirements in assignments. For example, we were able to identify common “problem assignments” including scavenger hunts and assignments that required students to locate specific and often hard to locate sources (e.g., print books for recent technology trends). In some cases, we were able to contact faculty members to clarify assignment instructions. In others, we created instructional LibGuides before the assignment was due. We also worked with faculty to revise assignments completely after seeing how frequently students were getting hung up on certain aspects of the research process. We have been able to use this data as a foot in the door to discuss larger questions of information literacy learning outcomes that are best suited for students at different stages in their coursework and in specific degree programs.

Using recorded reference questions as one window into student learning has enabled librarians to better diagnose why students are not meeting information literacy learning outcomes. Rather than just knowing that students did not perform well on a paper or other assignment, librarians have been able to use reference question trends to provide clues about major areas of confusion and struggle. For example, librarians have started to discuss how simply locating peer-reviewed sources does not necessarily mean that students can develop a focused topic, evaluate sources, or often even understand the source. This knowledge has enabled librarians to work with faculty on more targeted assignment design or instruction interventions.

In all of these cases, librarians were able to use regularly collected data to make informed decisions to improve services and student learning experiences on a variety of levels. Currently, our research question data is almost constantly analyzed to assess our library website and make immediate improvements. In other cases, trends in user questions related to assignments have been combined with other assessments of student learning to advocate for large-scale changes to assignment and course design.

We learned several key lessons along the way. First, make data collection part of everyone’s daily routine and make it open. Everyone becomes part of the assessment team and can identify trends, connect multiple types of data, and provide concrete suggestions for improvement based upon a rich set of data. Second, analyze the data and apply it to decision making from the outset. There is no need to wait to have a “complete” or “year-end” set of data to do some basic analysis. Library staff saw that this data was actually being used to inform and improve practice, thus encouraging them to continue collecting it and mining it for their own purposes. Collecting research questions became routine practice, which meant that we were not restricted to one use for that data. Our Services Department could use the data to see how to improve the study room reservation system, while subject librarians could use it to identify collection needs or to develop better self-help instructional material.

This one data set cannot answer all of our assessment needs. It does not, for example, provide evidence of student learning on its own. But our research help dataset has helped move assessment practices to a more central place as part of the daily workflow of the library. In many cases, we are able to move beyond arguments of anecdote and gut instinct in order to identify problems and service improvements. In other cases, we are able to identify weaknesses in our data collection and assessment efforts. Open, everyday data that is actually used has become an essential element for building and sustaining our local culture of assessment.

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Notes

Appendix
Research Help Desk LibAnalytics Questions
Abstract
In the 2013–2014 fiscal year, Boise State University underwent a Program Prioritization Process (PPP) adapted from Robert Dickeson’s Prioritizing Academic Programs and Services: Reallocating Resources to Achieve Strategic Balance. The review was mandated by the Idaho State Board of Education (SBOE) for public higher education institutions statewide. The SBOE required a review of all programs including the library. Programs in this case were defined by the SBOE as including “any activity or collection of activities that consumes resources (dollars, people, time, space, equipment).” When beginning this project, Boise State’s Albertsons Library had difficulty finding information on other libraries that had undergone Dickeson’s prioritization or found that the information available was not detailed enough to be helpful. Developing data and a narrative of meaning to university administrators and the SBOE that was also of value internally for benchmarking and future tracking of library programs and services was a challenge throughout the project. This paper reports on a survey of other academic libraries reviewed under Dickeson’s process, the critical junctures early in the process, and the different decisions made by libraries at each juncture in comparison with choices made by Albertsons Library. Was the library included in the prioritization process and if yes, how? How were “programs” defined? What configuration of library programs resulted? What criteria were used to evaluate each program and who identified them? This paper also addresses the challenge of identifying metrics to measure the success of library programs within each criteria, the most and least valuable aspects of the process, and what was learned by undertaking prioritization.

Introduction
In the 2013–2014 fiscal year, Boise State University underwent a Program Prioritization Process (PPP) patterned after Robert Dickeson’s Prioritizing Academic Programs and Services: Reallocating Resources to Achieve Strategic Balance. The review was mandated by the Idaho State Board of Education (SBOE) for public higher education institutions statewide. The SBOE required a review of all programs including the library. Programs in this case were defined by the SBOE as including “any activity or collection of activities that consumes resources (dollars, people, time, space, equipment).” When beginning this project, Boise State’s Albertsons Library had difficulty finding information on other libraries that had undergone Dickeson’s prioritization or found that the information available was not detailed enough to be helpful. Developing data and a narrative of meaning to university administrators and the SBOE that was also of value internally for benchmarking and future tracking of library programs and services was a challenge throughout the project. This paper reports on a survey of other academic libraries reviewed under Dickeson’s process, the critical junctures early in the process, and the different decisions made by libraries at each juncture in comparison with choices made by Albertsons Library. Was the library included in the prioritization process and if yes, how? How were “programs” defined? What configuration of library programs resulted? What criteria were used to evaluate each program and who identified them? This paper also addresses the challenge of identifying metrics to measure the success of library programs within each criteria, the most and least valuable aspects of the process, and what was learned by undertaking prioritization.

Literature Review
Prioritizing programs requires administrators demonstrate the value of what is done in each of its programs. In a time when state support of higher education institutions is stagnant and the rhetoric in the media seems focused on the rising cost of college degrees, prioritization offers a method of
evaluating programs, reallocating resources, and capitalizing on efficiencies that may move beyond a faculty sense of program ownership and an academic culture resistant to reallocating funds between programs.  

Attempts to estimate the value of academic libraries is nothing new. As president of the Association of College and Research Libraries (ACRL) in 2006–2007, Pamela Snelson set an agenda of better documenting and communicating the value of academic libraries to stakeholders. Literature attempting to illustrate the value of academic libraries is far too voluminous to discuss here. For an excellent summary of literature on the value of academic libraries and a comprehensive bibliography of the literature, see The Value of Academic Libraries, prepared by Dr. Megan Oakleaf for ACRL in 2010.  

What is new to libraries about Dickeson’s approach is the requirement to comprehensively evaluate all activities using the same criteria, documentation templates, and rating instruments as other campus programs.

Dean and Provost published a two-part report on a survey they conducted of college and university administrators in the United States, Canada, and the Caribbean to find out whether institutions had plans to prioritize. Fifty-eight percent of survey takers “had a plan in place for academic prioritization or were in the process of creating one.” In addition, 88% of the institutions that have a prioritization plan said that the plan includes evaluation of the entire institution. The articles outlined the primary reasons for prioritization, the reasons some institutions had for not planning to prioritize, recommendations for developing and implementing a prioritization plan, and how to choose criteria.

Two publications discuss Dickeson’s prioritization process in relation to other models of budget reallocation or program evaluation. In his PhD dissertation, Oren Yagil evaluates decision-making processes related to prioritization during budget cuts. He briefly evaluates different models of budget review, including Dickeson’s prioritization process, as part of an overall discussion of decision-making processes when making vertical cuts to programs. Yagil notes that his discussion of prioritization is largely based on Dickeson’s book. Dellow and Losinger describe Dickeson’s model as excellent and the process logical, “but costly in both time and funding to implement frequently enough to be practical.” As a result, both the authors’ institutions opted for a simplified process that looks at enrollment and cost of programs.

The majority of the materials written on Dickeson’s process are written by Dickeson. Prioritizing Academic Programs and Services is designed to describe the prioritization process from the point of the administrators who will be developing, implementing, and coordinating the process institution wide. The prioritization process is designed to allow different programs across an academic institution to be evaluated equally. For a brief but well done summary of the process, see Grube, Schoon, and Grube’s “Program Prioritization: Staying the Course through the Storm.”

In 2010, Dickeson surveyed 550 higher education administrators from 300 institutions in the United States, Canada, and Puerto Rico about key aspects of the prioritization process. The survey summary is available on the Education Metrics website (Dickeson’s company) and describes the administrators’ responses to questions about the reasons driving prioritization, expected outcomes, perceived challenges, evaluative criteria, and potential sources of data for each criterion.

Dickeson stresses that the programs of an institution should revolve around the institution’s mission and strategic plan, represent the unique character of the institution and focus on activities that add value to stakeholders (students, faculty, parents, community members, etc.). The process should result in substantive changes and recommendations for improvement at all levels, however the text primarily discusses outcomes for programs in the top and bottom 20% of programs and on evaluating degree granting programs. Non-degree support units such as administration and athletics are mentioned briefly in less detail.

Survey Methodology
When Albertsons Library was charged to undertake program prioritization, one of the first steps was to look for examples of what other libraries had done through this process. A thorough search of the Internet and higher education literature identified 77 institutions primarily in the United States and Canada that had undertaken Dickeson’s prioritization process. However, very few of these
institutions shared the documentation of their process. Those that did tended to share information about degree granting programs only, the end result in general or a ranked list of university wide programs, leaving the actual selection of criteria, metrics, and data points a mystery. Given the challenges experienced with the process, questions arose about how other libraries had handled certain aspects of prioritization.

While developing the survey, it was immediately apparent that the complexity of the process dictated careful consideration of questions to include. Attempting to ask survey questions on every step of the process resulted in a survey so lengthy that few were likely to complete it. In addition, based on the experience at Boise State and information found through research, there seemed to be a considerable reluctance on the part of institutions to share information about the process and outcomes. It was reasonable to assume that institutions would be equally reluctant to share through a survey. Thus a decision was made to focus on (1) the process of defining and identifying programs, (2) identification of evaluation criteria, (3) general perceptions of the value of the process and (4) the challenges the process raised.

A 30 question survey was designed and e-mail invitations sent to 286 academic libraries at four-year institutions in the United States, including members of the Association of Research Libraries (ARL), Association of College and Research Libraries (ACRL), and 77 institutions known to have embarked on Dickeson’s prioritization process. One hundred thirteen institutions responded, a response rate of 39.5%. Of the 113 institutions, 19 (23%) were among the 77 known to have undertaken Dickeson’s Prioritization process, 28% had been through some sort of prioritization, but were not sure it was specifically Dickeson’s recommended process. Eleven percent had been through a prioritization process designed at their institution, and 37% said they had not experienced a prioritization process (see Figure 1).

Figure 1—Within the last 10 years, has your academic institution undergone a program prioritization process based on Robert C. Dickeson’s Prioritizing Academic Programs (2010)?

Given the small number of institutions that had experienced the process, the survey answers may give a hint at variations in how the prioritization process was implemented, but cannot be judged significant. In addition, 68.5% of those who had undergone Dickeson’s prioritization process had begun in 2013 or later and the process was not yet complete at the time of the survey. Therefore the number of responses dwindled as the survey progressed into later aspects of the process. Although the expectation was that institutions had not tended to include academic libraries in the process, 68% of respondents said they were required to prioritize in a process similar to degree-granting units (see Figure 2). Another 16% said the library was included as an indication of the strength of an academic degree granting program such as library materials and services in support a program. This is similar in scope to what Dean and Provost found in their survey, where 88% of those with a prioritization plan included the entire organization.
Program Definitions
In his book, *Prioritizing Academic Programs*, Dickeson defines a program as “…any activity or collection of activities of the institution that consumes resources (dollars, people, space, equipment, time).” Boise State University and a third of the respondents used this definition or a minor variation of it. Another third of the respondents said a program was defined as any unit granting a degree or major. The remaining respondents described several other methods used to define programs including:

- A budget was divided by operational lines as a method of defining programs
- Each area of the strategic plan a program
- Program definitions were left up to each unit

Program Identification
Once a program definition is established, the programs that will be evaluated are identified. Respondents were asked how much autonomy they had in identifying library programs. Fifty percent said they were able to choose their programs with approval from a steering committee or administrator (see Figure 3). Thirty percent said the choice of programs was dictated by the program definition, or by a steering committee or administrator. Twenty percent said they had complete autonomy in choosing the configuration of library programs.

At Boise State, Albertsons Library had considerable autonomy throughout the process, with approval required only of the program and metric choices. At the outset, the library put together a Prioritization Process Team (hereafter referred to as “the team”) of six members selected from among the staff and faculty to guide the process, collect data, and draft documentation. Every library unit head worked with their unit to develop a list of activities within their unit. Each team member then took these activities lists, reviewed them, and gathered activities into no more than 10 programs. The team met, shared ideas, identified several common programs, and discussed how to group the remaining activities. The process resulted in seven programs. As the team wrestled with the number and structure of library programs, several themes emerged:

- **Mission and Strategic Plan:** Programs must be aligned with the university’s and library’s missions and strategic plans.
- **Audience:** Documentation would be written for several audiences: A small group of raters, the university provost and president, and the SBOE.
- **Departments versus Activities:** Very few activities in Albertsons Library occur only in one department. For example, with the exception of library administration, all library faculty members teach and many serve on the
reference desk even if they are not part of the reference and instruction unit. If programs were identified by departments, how would this interdependence be addressed? If programs were identified by activities, how would resources such as faculty and staff time be allocated to each program?

- **Staff Time versus Benefit:** The more programs, the more staff time is spent gathering data and creating documentation, and there is increased complexity of allocating resources across programs. In contrast, the fewer programs, it is less likely new information would be learned about the library in the process.

- **Maintain Collegiality:** Albertsons Library is a collegial, collaborative place and it was paramount that this collegiality be maintained. The prioritization process requires an institution to rank programs and put them into five equal sized quintiles, which can encourage competition and uncertainty. When Dean and Provost asked administrators for reasons why they did not plan to prioritize programs, the fact that the process tends to be divisive was raised. Indeed, as reported by Nick DeSantis in the Chronicle of Higher Education, a University of Alaska Anchorage professor, “in an e-mail to faculty members, likened the project to the Hunger Games” where departments compete to eliminate each other. The Hunger Games effect of the process discouraged Albertsons Library from using the departmental structure to dictate programs for prioritization.

- **Risk Assessment:** Identifying the library as one large program would simplify the process. However, what would happen if the library was one program and that program ended up in the bottom 20% of the rankings? What were the chances that the outcome would be positive?

- **Relationship to Academic Unit Process:** In some cases, it was decided to separate an activity into a program because of an assumption that the academic units would be evaluating the same activity and the library could use a parallel process with the metrics and data sources.

Survey respondents with a choice had considered similar factors in deciding on programs. Interestingly two of the areas that carried considerable weight for Albertsons Library, the perceived negative competition from selecting departments as programs and the potentially negative impact of evaluating the library as one large program, were mentioned less often (see Figure 4).

**Figure 4—Library Considerations for Program Selection**

<table>
<thead>
<tr>
<th>Consideration</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Match to Strategic Plan</td>
<td>40%</td>
</tr>
<tr>
<td>Match to Departmental Structure</td>
<td>40%</td>
</tr>
<tr>
<td>Final Report Audience</td>
<td>40%</td>
</tr>
<tr>
<td>Match Programs to Available Data</td>
<td>30%</td>
</tr>
<tr>
<td>Complexity of Allocating Resources</td>
<td>20%</td>
</tr>
<tr>
<td>Staff Time versus Perceived Benefit</td>
<td>20%</td>
</tr>
<tr>
<td>Positive/Negative Impact of the Library as One Program</td>
<td>20%</td>
</tr>
<tr>
<td>Negative Impact of Competition Among Departments</td>
<td>10%</td>
</tr>
</tbody>
</table>

As shown in Figure 5, the resulting configuration of programs among libraries coalesced into four categories. Thirty percent evaluated the library as one large program. Thirty percent structured programs around activities, and 10% allowed the departmental structure to dictate choice of programs. Among the remaining 30%, programs were distributed in a variety of ways, for example based on budget lines or facilities (e.g., branch libraries). In one case, the instructional activities of the library for credit bearing courses were evaluated with university degree programs, and the rest of the library services as a group with non-academic programs.
Albertsons Library started the prioritization process by identifying seven programs. As diagramed in Figure 6, two programs were eliminated as the project moved forward by merging them into the five remaining programs. As will be discussed later in this paper, the wording of the standardized report template had an impact on choices made early in the process. For definitions of the five programs and examples of what activities are included, see Figure 7.
### Figure 7—Albertsons Library’s Program Definitions

<table>
<thead>
<tr>
<th>Program</th>
<th>Definition</th>
<th>Includes (for example)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campus and Community Engagement</td>
<td>All activities in support of campus and community activities and groups, including the physical surroundings that support research, study, teaching and engagement, and protect valuable resources held in the library</td>
<td>Collection access to community patrons, outreach, events, non-class related presentations &amp; workshops, campus committee work, community service, employing students, campus and community partnerships and collaboration, student computer lab &amp; public workstations, wireless network, printing, iPads &amp; laptops for checkout, etc.; quiet study spaces, collaboration spaces, safety and facility maintenance, configuration of spaces, furniture, etc.</td>
</tr>
<tr>
<td>Content Creation, Discovery, Access and Delivery (CCDAD)</td>
<td>Content creation and the collections, personnel, software and processes that allow users to discover, access and receive delivery of materials</td>
<td>Acquisitions, receiving, cataloging, metadata, circulation, ILL, reserves (e and print), link resolver, web pages, mobile apps, Voyager, WCL; Collections, Archives, Special Collections, Scholar Works, gifts, Government Docs, servers, programming support, etc.</td>
</tr>
<tr>
<td>Instruction</td>
<td>The design, development and delivery of instruction via in-person &amp; online classes, and through multimedia tools</td>
<td>Teaching, course design, instructional videos, collaborating with faculty to design assignments, development of multimedia instructional tools, LibGuides, etc.</td>
</tr>
<tr>
<td>Library Administration</td>
<td>The personnel and resources associated with management and administration of library activities overall, including activities related to library faculty scholarship and professional service and professional development for all employees</td>
<td>Deans office personnel, budget, HR activities, donor relations, network services management, publications, research, professional service, conference presentations, professional development activities, etc.</td>
</tr>
<tr>
<td>Research Consulting and Collaboration</td>
<td>Services and activities in support of faculty, student and community users’ research</td>
<td>Research support, reference and information services, liaison activities, consulting with faculty and students on data management and metadata, in depth research help, intellectual property, copyright, author rights, open access, etc.</td>
</tr>
</tbody>
</table>

Given 68% of the respondents were just beginning the prioritization process when the survey was administered, very few survey respondents were able to answer questions beyond the process of identifying programs. Among the eight respondents who identified more than one program, the number of programs per institution varied from two to eleven, with a total of 41 separate programs. While the program titles and configurations varied greatly, many of them are familiar library activities. See Figure 8 for programs listed by two or more respondents.
Evaluation Criteria
The next step in Dickeson’s process is identification of evaluation criteria. At Boise State University, the criteria were suggested by an implementation team that managed the process, vetted with input from across campus and used institution-wide to evaluate programs, including the library’s. When asked about identification of criteria, 67% described a similar process at their institution. Two respondents said campus administration selected the criteria and one institution said campus wide criteria informed the library’s choice of criteria.

Dickeson recommends 10 criteria for evaluation of academic programs: history background and relevance, quality inputs, quality of outputs, costs, revenue generated, productivity, internal demand, external demand, impact, and opportunity analysis. The number of criteria reported by respondents varied from 3 to 10. All but one institution used criteria that followed Dickeson’s recommendations closely, with the most common modification the merging of criteria, such as Demand instead of External Demand and Internal Demand. One reported criteria that were uniquely suited to the institution with very little resemblance to Dickeson’s criteria. The most common reported criteria are listed in Figure 9. Boise State chose to evaluate programs along five criteria: Quality, Relevance, Productivity, Efficiency, and Opportunity Analysis.

Figure 8—Programs mentioned by more than one respondent

<table>
<thead>
<tr>
<th>Program Activity</th>
<th>Number of Mentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Services, Discovery</td>
<td>4</td>
</tr>
<tr>
<td>Archives, Special Collections</td>
<td>4</td>
</tr>
<tr>
<td>Collections and Materials in general</td>
<td>4</td>
</tr>
<tr>
<td>Technical Services</td>
<td>3</td>
</tr>
<tr>
<td>Administration</td>
<td>3</td>
</tr>
<tr>
<td>Research</td>
<td>3</td>
</tr>
<tr>
<td>Identified Collections (e.g. Government Documents)</td>
<td>3</td>
</tr>
<tr>
<td>External Relations</td>
<td>2</td>
</tr>
<tr>
<td>Instruction, Teaching</td>
<td>2</td>
</tr>
<tr>
<td>Interlibrary Loan</td>
<td>2</td>
</tr>
<tr>
<td>Reference Services</td>
<td>2</td>
</tr>
<tr>
<td>IT Systems</td>
<td>2</td>
</tr>
<tr>
<td>Specialized Branch Libraries</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 9—Evaluation Criteria reported by Library Respondents

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Percentage of Institutions reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality, Quality Inputs, Quality of Outcomes</td>
<td>78%</td>
</tr>
<tr>
<td>Cost or Cost Effectiveness</td>
<td>67%</td>
</tr>
<tr>
<td>Demand, Internal Demand, External Demand</td>
<td>67%</td>
</tr>
<tr>
<td>Opportunity Analysis</td>
<td>56%</td>
</tr>
<tr>
<td>Centrality to the Mission</td>
<td>44%</td>
</tr>
<tr>
<td>Importance, Relevance, Essentiality</td>
<td>44%</td>
</tr>
</tbody>
</table>
As reported by Dean and Provost, the five most commonly mentioned criteria were a program’s: enrollment (94%), relevance to the mission (81%), cost (75%), future potential (72%), and academic quality (69%). Results similar to what was found here.

Dickeson’s process allows for criteria to be treated equally or to be weighted so that particular criteria demonstrate more importance than others. At Boise State, the group within which the library was evaluated chose to weight the Quality and Relevance criteria more heavily than Cost Efficiency and Productivity (see Figure 10).

**Figure 10—Criteria Weights used at Boise State University**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>0.3</td>
</tr>
<tr>
<td>Relevance</td>
<td>0.3</td>
</tr>
<tr>
<td>Productivity</td>
<td>0.2</td>
</tr>
<tr>
<td>Cost Efficiency</td>
<td>0.2</td>
</tr>
<tr>
<td>Opportunity Analysis</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>

For an example of how weights can be applied for a larger number of criteria and a sample matrix of how the final weighting structure might look, see Grube, Schoon, and Grube.18

**Metrics**

Once programs are identified and criteria established, metrics and key data points are chosen to be used to measure the success of each program against the criteria. These data points should be comparable with peers, either across campus or within the discipline. Albertsons Library had autonomy in choosing metrics, as did 34% of survey respondents. Other respondents reported using campus-wide metrics (22%) or campus-wide metrics with some modifications (22%) to better fit the library environment. Eleven percent reported that they were not sure as the process was not that far along at their institution (see Figure 11).

**Figure 11—How Metrics were Chosen for Library Programs**

At the beginning of the process, Albertsons Library decided to (1) use prioritization to identify gaps in the data gathered and where existing data served little purpose, (2) use existing data rather than gathering new data, (3) choose a few specific data points as representative of each criteria for each program, and (4) focus on data from national sources where peer comparison data was available such as that from the Integrated Post-Secondary Education Data System (IPEDS) and the Association of College and Research Libraries (ACRL). The team focused on items where data could be converted to percentages or ratios for comparison, and where long term data illustrated trends in Albertsons Library’s performance in relation to peers. The resulting metrics and their
sources are outlined in Appendix A—Albertsons Library Program Prioritization Metrics. In some cases, where data was not available, research studies were cited as examples that potentially demonstrated the impact of the program.

Program Documentation, Rubrics, and Rankings
Once metrics are chosen, an administrator develops documentation on each program using a standard report template consisting of a series of questions to elicit discussion of metrics and related data. At Boise State, the development of the report templates occurred simultaneously with the identification of programs and metrics. A prioritization implementation team drafted the report templates and rubrics for each division, then the templates were edited and vetted by the divisions that would use them to create program reports. Once the report templates were finalized, scoring rubrics were developed using the same process. Albertsons Library was evaluated as part of the Administrative and Support Programs division of Academic Affairs. Copies of the standard report templates and scoring rubrics used for review of Administrative and Support Programs at Boise State are available in Appendices B and C.

Once the documentation was compiled for each program, the reports were reviewed and rated using the relevant division rubric by representatives from each division and two reviewers who were external to the division. The scores for the programs were summed, a ranking developed, and programs were put into five equal sized quintiles. Feedback was then given to each program administrator with an opportunity to respond to the results, and for each dean or senior leader to move programs within rankings and among quintiles with justification. Summary reports with recommended changes to programs (i.e., action plans) were written and sent up the hierarchy for evaluation, and a final summary report was eventually presented to the SBOE.99

Due to the level of secrecy and discomfort with prioritization and the few libraries expected to have gone through the process, a decision was made at the outset of this project not to ask about resulting rankings and quintiles for each library program at an institution assuming it might discourage participation.

Outcomes
Albertsons Library had five programs, resulting in one in each quintile. For the most part, the rankings were as expected. In areas where there was a considerable range of data available and good results, the program scored very well. For example, Content Creation, Discovery, Access and Delivery (CCDAD) ranked in the top quintile. As a result of this ranking and the recommendation of the group that scored and ranked the programs, the library received a 0.5% permanent increase in funding for library materials to offset some of the impact of inflation. Where little relevant data existed or peer comparisons were non-existent, a program scored poorly. For example, Library Administration, which will be discussed in more depth in the process analysis section of this paper, fell into the bottom quintile.

When survey respondents were asked about the overall outcomes of the prioritization process, 67% said the process was not finalized. Among the remaining institutions, 17% reporting decreased funding and 16% reporting increased funding (Figure 12). One question this research did not answer was whether the increases/decreases in funding matched the rankings for these programs. For example, did the budget decreases occur where programs were ranked in the bottom quintile?
Figure 12—Impact of Prioritization on Library Budgets

Prioritization Process Analysis
Survey respondents were asked what they found most valuable about the prioritization process. Their responses were similar both to each other and to the experience of Albertsons Library. Process aspects most often mentioned are outlined in Figure 13. Of particular note, the process:

- Was valuable as a method of educating other units and administrators about the unique aspects of academic libraries and an opportunity to advocate for the library across campus
- Required libraries to
  - Reflect on operations and question traditional practices
  - Identify opportunities for future growth

Figure 13—What was Valuable about the Process?

<table>
<thead>
<tr>
<th>Illuminating Discoveries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflecting on Library Operations</td>
</tr>
<tr>
<td>Working with Campus Team</td>
</tr>
<tr>
<td>Program Documents as Advocacy</td>
</tr>
<tr>
<td>Comparison to Other Campus Units</td>
</tr>
<tr>
<td>Learning about other units</td>
</tr>
<tr>
<td>Opportunity Analysis</td>
</tr>
<tr>
<td>Process of Data Gathering</td>
</tr>
</tbody>
</table>

Respondents reported learning surprising or illuminating information that will prove useful as they move forward. A few of the comments received are illustrated in Figure 14. Albertsons Library had a similar experience. In particular, a realization that nearly all of our data collection has been on library materials and the end users of the materials (students, faculty, staff, and community users). Data of consequence to other stakeholders that would document the value of other programs, such as Library Administration, was not collected. At the outset, the team was most concerned about how to describe the Quality and Relevance of library programs, yet in these criteria our programs scored best while evidence of comparative Productivity and Cost Efficiency was scarcer because data was not collected, reported, or available in national data sets.
Figure 14—Discoveries from the Process

Illuminating Findings:

- Key Performance Indicators (KPI) are crucial
- An enterprise data system is needed for better management and access to data
- Library structure is not aligned with strategic priorities
- Library Faculty productivity compared favorably to other campus faculty
- The process encouraged discussions of strategic directions beyond senior management
- In comparison to our peers, we are a lean operation
- Internal quality measures have been inconsistently applied
- Compared to our peers, our expenses are higher in some areas and lower in others

Respondents were asked what they found most challenging about the prioritization process. Again, their responses were similar to Albertsons Library’s experience (see Figure 15). In particular:

- **Prioritizing Academic Programs**
  - Designed to give guidance to individuals managing the campus wide prioritization process. Little attention is paid to the development of documentation on the part of program administrators.

- **Dickeson’s process**
  - Focused on evaluating degree granting programs, for which he gives detailed instructions and suggested data points. Although he claims the process also works for other units, the book gives little guidance on how to do this, most of which is focused on questions around how budgets can be cut.
  - For degree-granting programs, the process is driven at the administrative level. As Yagil describes the process, “decision makers following this model provide data to support the criteria...[and] the structure takes a form that leaves the burden of data collection with central administration using the Institutional Research Office.” Much of the data is culled from the institution’s data warehouse, metrics are chosen by a steering group and most of what goes into the program documentation is supplied to program administrators. However, non-academic units are left to their own devices to identify programs and metrics, and to find relevant data.

- **Prioritizing Academic Programs**
  - Contends that writing skills should not impact the outcomes of prioritization. However, that was not the experience among the group that worked together at Boise State. Where documentation was poorly written, it was difficult to judge the value of a program thus it scored less well. In fact, the need for writing and persuasive skills were particularly relevant for criteria such as Quality and Relevance where evidence tended to be more nebulous.

- The wording in the standardized report template sometimes complicated the evaluation of programs. Albertsons Library found that the nature of some questions lead to merge one program into another as documentation did not exist for what was being asked. For example, under productivity was the question “what time is spent on value-added activities that are aligned with program goals or outcomes?” (see Appendix A, Step 4a). The question made little sense in relation to the program “Library Physical Environment” as this program was meant to evaluate the condition of facilities, furniture, and student spaces. Thus Library Physical Environment was merged into Campus and Community Engagement. Similarly, one library reported that the evaluation of a library program was deferred because of a poor fit between the report template and the program.

- Dickeson’s prioritization process relies on comparative peer data for metrics and ideally, metrics are chosen early in the process. However, without guidance, Albertsons Library found it challenging to identify metrics before having a final version of the report template and rubric available. In addition, much of the data available from ACRL and IPEDS was ineffective in demonstrating value. For example, a cost per reference transaction would be an excellent ratio for peer comparison. However the relevant ratios from ACRL included more than just references costs, such as total expenditures on staff library-wide divided by the library’s reference transactions, which grossly overestimate the actual cost of reference. In addition, if campus peer data was not shared, no comparison data...
was available for activities such as faculty scholarly productivity.
• Proving the value of library administration as a program was particularly difficult. At Boise State, Library Administration was identified as a program because it was assumed that degree granting departments and college administrative units would be evaluated and the library would receive metrics and comparative data from institutional research for doing so. For a variety of reasons, that did not turn out to be the case. The team had little guidance on how to evaluate Library Administration. Other libraries reported a similar challenge.

**Table 4**—Challenging Aspects of the Process

<table>
<thead>
<tr>
<th>Proving Library Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed of Process</td>
</tr>
<tr>
<td>Library Administration as a Program</td>
</tr>
<tr>
<td>Trying to Quantify all aspects of the library</td>
</tr>
<tr>
<td>Limitations of documentation form &amp; Rubric wording</td>
</tr>
<tr>
<td>Lack of guidance on choice of programs, metrics, etc.</td>
</tr>
<tr>
<td>Repetitive questions in program documentation form</td>
</tr>
</tbody>
</table>

**Conclusion**

Due to the challenges of research into a process this complex and the number of responding institutions just embarking on the prioritization process in concert with the reluctance to share information, this project left many questions unanswered. The academic libraries that responded have found value in going through academic prioritization. If undertaken seriously, the process requires reflection and can illuminate areas where a library needs to better define the value they add to the institution and the key performance indicators that define success. However, in this author’s opinion, the process is too complex and time consuming to perform regularly. In addition, the reliance on writing skills puts some program administrators at a disadvantage. Instead, prioritization for academic libraries should be used to identify key data points demonstrative of a program’s value so that data can be collected and routinely monitored without the onerous documentation process.

At Boise State as an outcome of prioritization, Albertsons Library is embarking on a process to define one to three key performance indicators for each program, where data will be actively collected and evaluated via ongoing formative assessments that help document the library’s progress in ways that are relevant to external stakeholders and prepare the library for future reviews. The library will be changing the way some data is collected and assessed to better fit our programs, which are closely aligned to the university’s mission and strategic priorities. The process holds potential for greatly streamlining the data we collect and analyze, yet more concisely demonstrating our success.

As the need for accountability in higher education continues to increase and more academic libraries find themselves undergoing a similar process, the information gathered here may be of value in their decision making. Indeed, considering library value in terms of a prioritization process may help academic libraries target the key areas of value and importance to their institution and worthy of their focus.

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## Appendix A—Albertsons Library Program Prioritization Metrics

### Boise State University, Albertsons Library Program Prioritization Metrics

<table>
<thead>
<tr>
<th>Programs</th>
<th>Productivity</th>
<th>Cost Efficiency</th>
<th>Quality</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Library Admin &amp; Professional Development</strong>&lt;br&gt;Includes budget, planning, etc. and faculty and staff professional development activities</td>
<td>Administrative FTE: total library staff&lt;br&gt;completion of /progress toward of strategic plan action steps</td>
<td>Alignment of positions to strategic plan&lt;br&gt;Alignment of positions to university, state and federal requirements for managing resources</td>
<td>LibQUAL+ survey results&lt;br&gt;Employee evaluations</td>
<td>Compliance w/ state and Federal laws&lt;br&gt;Compliance with State of Idaho agency requirements</td>
</tr>
<tr>
<td>Library Admin &amp; Professional Development</td>
<td>Library faculty FTE: publications&lt;br&gt;library faculty FTE: presentations&lt;br&gt;library faculty FTE: professional service activities&lt;br&gt;library staff professional activities</td>
<td>Professional development activities related to strategic plan&lt;br&gt;Admin FTE: peer group&lt;br&gt;Staff per Admin FTE: peer group staff per admin FTE&lt;br&gt;Admin FTE per 1,000 FTE students compared to peers&lt;br&gt;Student &amp; staff FTE per 1,000 students compared to peers</td>
<td>Budget reviews&lt;br&gt;Staffing review and analysis&lt;br&gt;Peer Review of publications&lt;br&gt;Juried presentation selection&lt;br&gt;Promotion and Tenure process</td>
<td>Ensure Compliance with Boise State policies&lt;br&gt;Gather and report data to ACRL, IPEDS, etc.&lt;br&gt;Accreditation Review management&lt;br&gt;Facilitate achievement of strategic plan and objectives&lt;br&gt;Best Practice: ALA Library Bill of Rights&lt;br&gt;Faculty scholarship informs service decisions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Programs</th>
<th>Productivity</th>
<th>Cost Efficiency</th>
<th>Quality</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content Creation, Discovery, Access &amp; Delivery (CCDAD)</strong>&lt;br&gt;Includes web pages, Cataloging, Metadata, Mobile apps, discovery tools, ILL, Serials, CIRC, Acquisitions, digitization, etc.</td>
<td>Cost per use data&lt;br&gt;Improvements in time to receipt with Patron Driven Acquisitions; increasing requests</td>
<td>Expenditures per grad student compared to peers&lt;br&gt;Expenditures per faculty member compared to peers</td>
<td>LibQUAL+ survey results&lt;br&gt;Google Analytics&lt;br&gt;Project Counter data</td>
<td>University and college program Accreditation requirements&lt;br&gt;State Board requirements&lt;br&gt;Boise State policies on records retention&lt;br&gt;Congressional Mandate on federal depository items</td>
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<tr>
<td>Programs</td>
<td>Metrics</td>
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<tr>
<td><strong>Instruction</strong></td>
<td><strong>Productivity</strong></td>
<td><strong>Cost Efficiency</strong></td>
<td><strong>Quality</strong></td>
<td><strong>Relevance</strong></td>
</tr>
<tr>
<td>Participants per FTE librarian compared to peers</td>
<td>Trend data in students reached and classes taught</td>
<td>LibQUAL+ survey results</td>
<td>Relationship of instructional activities to university strategic plan goals</td>
<td></td>
</tr>
<tr>
<td>Classes taught per FTE librarian compared to peers</td>
<td>Expenditures on instruction in relation to peers</td>
<td>Course Assessments</td>
<td>Embedded in University Foundational Studies (core curriculum), UF 100, 200 &amp; 300</td>
<td></td>
</tr>
<tr>
<td>Partnerships for instruction: university, college, departments, faculty, community</td>
<td>Assessments used via one-shot instruction sessions</td>
<td>Institutional accreditation requirements</td>
<td>SBOE standards and goals</td>
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<tr>
<td>Pre and Post instruction assessments</td>
<td></td>
<td></td>
<td>Courses required by college programs</td>
<td></td>
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<tr>
<td>Reference studies of correlation between student use of library and student success</td>
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<tr>
<td>Programs</td>
<td>Productivity</td>
<td>Cost Efficiency</td>
<td>Quality</td>
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<td>---------------------------------------------------------------------------</td>
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<tr>
<td><strong>Research Consulting and Collaboration</strong></td>
<td>Reference Transactions per librarian compared to peers</td>
<td>operating expenditures per reference transaction compared to peers</td>
<td>LibQUAL+ survey results</td>
<td>Relationship of activities to university strategic plan goals</td>
</tr>
<tr>
<td>includes Scholar Works, IP, Data Mgt, copyright, reference</td>
<td>Reference transactions per staff FTE compared to peers</td>
<td>Total staff expenditures per reference transaction compared to peers</td>
<td>Chat transaction analysis and review</td>
<td>Institutional and college accreditation requirements</td>
</tr>
<tr>
<td></td>
<td>Total reference transactions compared to peers</td>
<td>Trends in cost per reference transaction compared to peers</td>
<td></td>
<td>SBOE requirements</td>
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<td>Transactions per week compared to peers</td>
<td>Trends in expenditures compared to peers</td>
<td></td>
<td>Federal data management requirements</td>
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<tr>
<td></td>
<td>Transactions per enrolled FT students compared to peers</td>
<td>Consortial agreements what we receive vs what we share/cost</td>
<td></td>
<td>Reference questions trends</td>
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<td></td>
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<td>partnerships : Office of Sponsored Programs re: data management</td>
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<td></td>
<td></td>
<td>Community partnerships</td>
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</table>

<table>
<thead>
<tr>
<th>Programs</th>
<th>Productivity</th>
<th>Cost Efficiency</th>
<th>Quality</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Campus and Community Engagement</strong></td>
<td>Weekly gate counts compared to peers</td>
<td>Expenditures on computer hardware &amp; software compared to peers</td>
<td>LibQUAL+ survey results</td>
<td>Relationship to campus strategic plan</td>
</tr>
<tr>
<td>includes outreach, campus committee involvement, presentations (non class related), workshops, events,</td>
<td>Traffic per FTE 12 month enrollment compared to peers</td>
<td>Expenditures per FTE 12 month enrollment compared to peers</td>
<td>Campus IT customer service survey</td>
<td>Unique collections</td>
</tr>
<tr>
<td></td>
<td>Campus service per library faculty and staff (university and community)</td>
<td>building traffic trends</td>
<td>BroncoPrint use data</td>
<td>Congressional Mandate on federal depository items</td>
</tr>
<tr>
<td></td>
<td>Trends in technology use</td>
<td>Revenue generated</td>
<td>Technology lending use data</td>
<td>Demand Trends: building use, Special Collections and Archives use, Technology checkouts</td>
</tr>
<tr>
<td></td>
<td>computer lab use data compared to other campus labs</td>
<td>Partnership with other campus units</td>
<td>Traffic flow data</td>
<td>2nd largest student employer on campus</td>
</tr>
</tbody>
</table>
Step 1: Please identify the program. A program is any activity or collection of activities that consumes resources (i.e., dollars, people, time, space, equipment, etc.). For your responsible area, please identify the major, significant activities that consume resources and complete one questionnaire for each of these programs. A program may follow org chart guidelines (i.e., a department) or a function (i.e., compliance). Collectively, all activities within an area must be represented within a program. Please keep in mind that areas are encouraged to keep programs broadly defined, so as not to produce more programs that can be reasonably evaluated.

1.a. Program Name:
1.b. Administrator:
1.c. Department/Unit:
1.d. Please identify the number of FTE in this program. Attach an organization chart, if applicable.
1.e. What are the total costs of the program by funding source (local, appropriated, one time, etc.) and expense category (salaries, O&E, travel, etc., excluding capital expenses)?

Step 2: Relevance. This measure is intended to demonstrate the importance of the administrative/support program and how that program is aligned with and supports the mission and strategic plan of the university. In addition, this criterion measures the overall essentiality and demand for its function.

2.a. Please describe how this program and its elements (e.g., goals and activities) align and support the university’s mission and strategic plan.
2.b. Is this this program required? If so, please elaborate using specific examples as evidence.
2.c. Are there current or proposed state, regional, or local mandates, or new policies or laws that impact external/internal demand for the program services or operations?
2.d. What are the essential services/functions your program provides? Do the actions...
of your program align to the core purposes/functions of your program (i.e., depth of intentionality in what you do)? Are the actions of the program informed by best practices?

2.e. What is the demand for these services? And, how is that demand measured? How do you expect the demand to change in the future and what are the drivers of that change?

2.f. For whom are the services/functions provided? Who are the direct, indirect and primary customers?

2.g. Are there any internal or outsourced programs/units providing similar services? If so, how do the services offered by this program differ from theirs?

Step 3: Quality. This measure is intended to identify the ability of the administrative or support program to meet its stakeholder needs, including evidence of the quality of services performed and how the services provided meet goals of the program.

3.a. What is your assessment plan/process? How do you assess the quality, effectiveness, and impact of what you do? Include: what you assess, how (i.e., methods), and how often?

3.b. What are your findings from assessment? How effective/well are functions executed and services provided? How do you know you are achieving your outcomes? Please provide evidence from assessment measures, including survey results, etc.

3.c. How do you ensure that data are used to improve the program? Provide two to three top examples of changes that have been made based on the data.

3.d. Please elaborate on occurrences within the program that have an impact to quality of services provided such as training for personnel, staff turnover, etc.

Step 4: Productivity. This measure is intended to assess not only the quantity of the program, but the overall impact of the work. In addition, the measure includes a scan of potential improvements that could influence overall productivity.

4.a. Please provide evidence from measures that demonstrate the volume of work performed by this program, such as average turnaround times, and average backlogs. What time is spent on value-added activities that are aligned with program goals or outcomes?

4.b. Please provide external benchmarks, standards, or comparators, if relevant. How well has the program performed compared to these benchmarks?

Step 5: Efficiency. This measure is intended to demonstrate the amount of work being performed and how resourcefully those tasks are performed.

5.a. Please describe the scope of duties for each FTE in this program. How well aligned are the position assignments/responsibilities to the core functions of the program?

5.b. Please provide benchmark data addressing how the resources of the program (structure, staff, costs, processing cycles, etc.) and scope of the duties compare with similar/same programs at peer institutions. Please describe why/how the peer institutions were selected as the most appropriate benchmark.

5.c. Does the program have any operations or collaborations that generate revenue (both direct and indirect) or result in cost savings (both direct and indirect)? If yes, please
describe and quantify.
5.d. Does the program foster active collaborations and partnerships to achieve its outcomes and reduce redundancies? If so, what are the collaboration/partnerships and what is gained?
5.e. Are there anticipated changes that will affect efficiency of the program in the near future?
5.f. Have opportunities for savings or additional investments been identified? If yes, please describe.

**Step 6: Opportunity Analysis.** This measure is intended to provide an opportunity to address unmet needs and potential for changes/enhancements to the program that would advance the goals of the university.

6.a. Does the program have unmet needs? How do you know?
6.b. Are there improvements that could be made to save on labor or to improve the product/services offered in the following categories? If so, describe in detail the efficiencies that could be gained.
   a. Technology improvements.
   b. Business process improvements.
   c. Collaborative opportunities.

6.c. What would the program accomplish (e.g., what goals or desired outcomes could be achieved?) if additional resources were made available? What type of investment would be needed and what is the estimated impact?
6.d. What risk factors impact your ability to deliver essential services (funding, staffing, facilities/space, etc.)?
6.e. Do you have resources available to reallocate to another area?

**Other Information:**

7.a. Please provide information that is relevant to the evaluation of the program that is not included in the questions provided above.

**Supporting Documentation Matrix**

If you have attached supporting data/evidence to answer a particular question in the Program Assessment Report (Questionnaire), please identify that document below.
<table>
<thead>
<tr>
<th>Question</th>
<th>Name of attached supporting data / evidence</th>
<th>Location in this report (i.e., Appendix A, pp. 25–26, etc,)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.a.</td>
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<td>1.b.</td>
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<td>2.a.</td>
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<td>5.a.</td>
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<td>6.a.</td>
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<td>6.e.</td>
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</table>
Appendix C – Boise State University—Academic Affairs—Administrative and Support Programs Review Rubric

Boise State University—Academic Affairs—Administrative and Support Programs Review Rubric—FINAL 11.06.13 (PRINT LEGAL-SIZED)

1.a. Program Name: _________________________________________
1.b. Administrator: __________________________________________
1.c. Department/Unit: ________________________________________
1.d. #FTE in the program: ___________________________________
1.e. Total costs by funding source: ______________________________
<table>
<thead>
<tr>
<th>Item</th>
<th>Criteria</th>
<th>Limited/None</th>
<th>Moderate</th>
<th>Exemplary</th>
<th>Reviewer Notes</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.a</td>
<td>Position/FTE responsibilities</td>
<td>Positions in the scope of the program are not well-defined, alignment to the program mission/goals is unclear, and/or duties significantly overlap creating a duplication of effort.</td>
<td>Positions in the scope of the program are reasonably well-defined and distinctive although alignment to the mission/goals is unclear and some duplication of effort may be occurring.</td>
<td>Positions in the scope of the program are well-defined, aligned to the mission/goals of the unit, and distinctive in that duties are appropriately assigned.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.b</td>
<td>Resource analysis vs. peers</td>
<td>Compared to peers, the program appears more costly or less efficient or the return on investment is unclear OR identified peers appear to be inappropriate for comparison.</td>
<td>The program appears to be operating on par with peers in terms of cost to operate and overall return on investment AND the identified peers appear to be appropriate for comparison.</td>
<td>Compared to peers, the program appears more efficiently run, with less cost and greater return on investment AND the identified peers appear to be appropriate for comparison.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.c</td>
<td>Revenues or cost savings</td>
<td>The program does not generate revenue or engage in practices/collaborations that result in cost savings.</td>
<td>The program may generate revenue or engage in practices/collaborations that result in cost savings.</td>
<td>The program generates revenue and engages in practices/collaborations that result in cost savings.</td>
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</tr>
<tr>
<td>5.d</td>
<td>Collaborations/partnerships</td>
<td>Collaborations/partnerships are not identified AND/OR resources are not leveraged to maximize the return from the partnership AND/OR no evidence of the gain from the partnership is provided.</td>
<td>Collaborations/partnerships are identified; resources are leveraged appropriately; and limited evidence is provided to illustrate the partnership's contribution to the program achieving its goals/outcomes.</td>
<td>Value-added collaborations/partnerships are identified; resources are appropriately leveraged; and evidence is provided to illustrate the partnership's contribution to the program achieving its goals/outcomes.</td>
<td></td>
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</tr>
<tr>
<td>5.e</td>
<td>Context: Anticipated changes that will affect efficiency of the program in the near future (including any opportunities for savings that have been identified)</td>
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<tr>
<td>5.f</td>
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<tr>
<td><strong>Opportunity Analysis</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>6.a</td>
<td>Unmet needs and sources of evidence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Criteria</td>
<td>Limited/None</td>
<td>Moderate</td>
<td>Exemplary</td>
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</tbody>
</table>
| 6.b. | Identified efficiencies in  
   □ Technology  
   □ Business process  
   □ Collaborative opportunities | Improvements that are identified appear to have limited capacity to improve efficiency or the gains are not identified. (check as applicable)  
   □ Technology  
   □ Business process  
   □ Collaborative opportunities | Identified improvements have some capacity to increase efficiency. (check as applicable)  
   □ Technology  
   □ Business process  
   □ Collaborative opportunities | Identified improvements are promising and appear to provide strong pathways for increasing efficiency. (check as applicable)  
   □ Technology  
   □ Business process  
   □ Collaborative opportunities |
| 6.c. | Use for additional resources, investment needed, & estimated impact | | | |
| 6.d. | Risk factors (funding, staffing, facilities/space, etc.) | The program appears unstable due to multiple risk factors and is not well-positioned to continue delivering its services. | The program has uncertainties in one or more areas, but appears stable enough to continue delivering services and achieve its goals. | The program appears stable and/or well-positioned to continue delivering its services and striving to meet its goals. |
| 6.e. | Resources available for reallocation | | | |

**Other Information**

| 7.a. | Additional relevant context | Reviewer Notes |
Endnotes


2. Selena Grace and Matt Freeman, Memorandum to Provosts and Financial Vice Presidents re: Academic and Administrative Program Prioritization (State Board of Education, May 17, 2013).

3. Dickeson, Prioritizing Academic Programs and Services, 21.


14. Dickeson, Prioritizing Academic Programs and Services, 56.

15. Dean and Provost.


17. Dean and Provost.

18. Grube, “Program Prioritization.”


Community College Libraries and Culture of Assessment: A Survey of Library Leaders

Lisa Janicke Hinchliffe
University of Illinois at Urbana-Champaign, USA

Meredith Farkas
Portland State University, USA

Abstract
In an environment in which libraries increasingly need to demonstrate their value, illustrating how the library contributes to student learning and success through its service programs is critical. However, creating a culture of meaningful assessment can be quite a challenge, even with colleagues who are passionate about teaching and an administration that values assessment. This study provides a specific look at community college libraries, an under-studied institution in general and specifically so with respect to libraries and assessment. Results from community colleges are compared to those from four-year institutions to identify similarities and differences across institutional types relative to the development of a culture of assessment at each. Taken together, the studies of community college and four-year institutions establish a baseline for future students of the culture of assessment in academic libraries.

Culture of Assessment
In Lakos and Phipps' seminal work “Creating a Culture of Assessment: A Catalyst for Organizational Change,” they offer a definition of a culture of assessment from a presentation given by Lakos, Phipps, and Wilson, which is often quoted:

A Culture of Assessment is an organizational environment in which decisions are based on facts, research, and analysis, and where services are planned and delivered in ways that maximize positive outcomes and impacts for customers and stakeholders. A Culture of Assessment exists in organizations where staff care to know what results they produce and how those results relate to customers' expectations. Organizational mission, values, structures, and systems support behavior that is performance and learning focused.

Introduction
Libraries are increasingly called upon to demonstrate their value in the context of their institution’s mission and goals for student learning and success. Creating a culture of meaningful assessment can be quite a challenge even in a library staffed by colleagues who are passionate about teaching and an administration that values assessment. Assessment work—from gathering data to crafting the narrative of the impact claim—demands dedication, effort, time, and resources, all of which are components of a culture of assessment. This paper presents the results of a study of community college libraries that was designed to investigate empirically what factors facilitate and hinder such libraries in building a culture of assessment.

Methodology
This study used the same survey instrument that was successfully deployed by Farkas, Hinchliffe, and Houk with four-year institutions in the United States. Though the survey, deployed in Qualtrics, has 60 questions total, each respondent only received 41 or 42 questions, depending on their answers due to branching and skip-logic.
The first group of questions, which every respondent answers, asks about institutional characteristics and whether their library has a culture of assessment, defined in the survey as an environment “where assessment is a regular part of your institutional practice.” The questions common to all survey respondents are followed by yes/no questions regarding sixteen facilitating factors, identified in the existing literature as building a culture of assessment, and whether their presence helped facilitate a culture of assessment or the absence hindered. After a respondent answers whether a factor is present, through display logic, the survey asks if the presence facilitated, or if the absence was a barrier to, developing a culture of assessment. Finally, there are three open-ended questions designed to understand what respondents see as the most important factor facilitating or hindering their progress towards a culture of assessment.

In order to ensure that only a single response was submitted per community college, an e-mail was sent to individual library directors with a unique survey link that could only be used once. In the recruitment e-mail, library directors were asked to have the most appropriate individual at their library complete the survey. To develop a list of contact information for academic library directors at community colleges, a spreadsheet of the institutions was downloaded from the Carnegie Foundation for the Advancement of Teaching website. The e-mail address and name of each library director were identified using library websites and other publicly available information sources. In cases when a director’s name or contact information could not be found, the generic e-mail address for the library was used. In some cases, neither the director’s contact information nor any contact information for the library could be found or the listed e-mail address did not work.

Results
Invitations to complete the survey were sent to 927 institutions and 292 responses were received, which is a response rate of 31.5%. This is a notably high response rate for a web-based survey that offered no incentives beyond the opportunity to contribute to understanding culture of assessment in libraries. The survey of libraries at four-year institutions also had a remarkable response rate of 42%.

The first question asked in the survey was about whether the respondent would describe their library as having a culture of assessment “where assessment is a regular part of your institutional practice.” Sixty-three percent of respondents answered yes and the remaining 37% responded no. In contrast, for four-year schools, 59% indicated they had a culture of assessment and 41% indicated that they did not.

The questions that followed asked about the presence/absence of factors and whether the presence facilitated the culture of assessment or the absence hindered. Table 1 presents responses to whether each of the factors is present at the respondent’s institution.
Table 1: Presence (Yes/No) of Factors in Order of Frequency

<table>
<thead>
<tr>
<th>Factor</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library culture is user-focused</td>
<td>279 (96%)</td>
<td>13 (4%)</td>
</tr>
<tr>
<td>Campus-wide assessment initiative exists</td>
<td>259 (89%)</td>
<td>33 (11%)</td>
</tr>
<tr>
<td>Library is involved in campus-wide assessment initiative</td>
<td>204 (79%)</td>
<td>54 (21%)</td>
</tr>
<tr>
<td>Assessment is a priority of library administration</td>
<td>231 (79%)</td>
<td>61 (21%)</td>
</tr>
<tr>
<td>Assessment data is available to interested parties</td>
<td>230 (79%)</td>
<td>62 (21%)</td>
</tr>
<tr>
<td>Librarians use assessment data to improve practice</td>
<td>222 (76%)</td>
<td>70 (24%)</td>
</tr>
<tr>
<td>Library leadership uses assessment data systematically in decision making</td>
<td>201 (69%)</td>
<td>91 (31%)</td>
</tr>
<tr>
<td>Library has access to systems/technologies that support assessment work</td>
<td>200 (68%)</td>
<td>92 (32%)</td>
</tr>
<tr>
<td>Education and training related to assessment are offered or supported</td>
<td>193 (66%)</td>
<td>99 (34%)</td>
</tr>
<tr>
<td>Shared understanding of the purpose of assessment in the library</td>
<td>187 (64%)</td>
<td>105 (36%)</td>
</tr>
<tr>
<td>Library staff/faculty are adequately supported in their assessment work</td>
<td>185 (63%)</td>
<td>107 (37%)</td>
</tr>
<tr>
<td>Library has adopted learning outcomes</td>
<td>181 (62%)</td>
<td>111 (38%)</td>
</tr>
<tr>
<td>Library has necessary skills in-house to develop and conduct meaningful assessments and analyze the results</td>
<td>181 (62%)</td>
<td>111 (38%)</td>
</tr>
<tr>
<td>Library leadership offers explicit support to get faculty/staff involved in assessment</td>
<td>162 (55%)</td>
<td>130 (45%)</td>
</tr>
<tr>
<td>Clear expectations for assessment in the library</td>
<td>152 (52%)</td>
<td>140 (48%)</td>
</tr>
<tr>
<td>Library has an assessment plan</td>
<td>131 (45%)</td>
<td>161 (55%)</td>
</tr>
</tbody>
</table>

In addition, it is interesting to note that community college libraries scored significantly higher than libraries at four-year institutions on three factors:
- Is there a shared understanding of the purpose of assessment in your library?
- Are library faculty/staff adequately supported in their assessment work?
- Does the library leadership use assessment data systematically in decision making and planning?

Community college libraries did not score significantly lower than libraries at four-year institutions on any of the factors.

Correlates with Culture of Assessment

Analysis of the responses about the presence/absence of each factor in light of the initial question about whether an institution has a culture of assessment revealed that all of the factors are statistically significantly associated with a culture of assessment. In addition, there are five factors whose presence is most strongly associated with a culture of assessment:

- Clear expectations for assessment in the library (90% who have it have an assessment culture)
- Assessment plan (82% who have it have an assessment culture)
- Shared understanding of the purpose of assessment in the library (81% who have it have an assessment culture)
- Library leadership uses assessment data (78% who have it have an assessment culture)
- Library leadership offers explicit support (77% who have it have an assessment culture)
Parallel, there are also five factors whose absence is most strongly associated with not having a culture of assessment:

- Assessment is a priority of administration (77% who do not have it do not have an assessment culture)
- Librarians use assessment data (72% who do not have it do not have an assessment culture)
- Assessment data available to interested parties (74% who do not have it do not have an assessment culture)
- Library leadership uses assessment data (70% who do not have it do not have an assessment culture)
- Shared understanding of the purpose of assessment (69% who do not have it do not have an assessment culture)

In addition to the factors, the survey asked respondents about the tenure status of librarians and by which regional accreditation association the community college was accredited. For community colleges, having tenure-track faculty status for librarians was positively correlated with having a culture of assessment, which was not the finding in the survey of BA, MA, and PhD-granting institutions. Like the four-year and above institutions, however, regional accrediting body does influence a library’s culture of assessment and those libraries at institutions accredited by the Southern Association of Colleges and Schools (SACS) or Western Association of Schools and Colleges (WASC) were most likely to have a culture of assessment.

Reflections
As with the results of the survey of four-year institutions, the open-ended comments that respondents provided reveal that whether a library is perceived to have a culture of assessment is indeed just that, a perception. Some libraries report a great deal of the factors being present and shared stories of how assessment has made an impact on their services for users but reported not having a culture of assessment. It appears that they are not satisfied with the culture even if it is bringing about results; whereas others asserted a culture even while identifying many areas for improvement.

Generally, however, it is clear that without an institutional commitment to assessment, a culture of assessment is far less likely to exist in the library. For those with a campus-wide assessment initiative, 66% report having a culture of assessment in the library. Having a plan for assessment in the library and clear expectations related to assessment is also important. When these two factors are in place, 92% report having a culture of assessment. The role of administration is also quite apparent—in libraries where assessment is a priority of administration, administration uses assessment data in decision making, and when administration adequately supports faculty/staff in assessment work, 88% of libraries report having a culture of assessment.

Conclusion
This study provides further guidance to both administrators and front-line librarians working to develop a culture of assessment. Perhaps more significantly, the results of this study provide a specific look at community college libraries, an under-studied institution in general and specifically so with respect to assessment. Like the previous study of libraries at four-year institutions, a culture of assessment was defined as one where assessment is a regular part of institutional practice.

Every one of the factors examined in the survey was significantly associated with having a culture of assessment; however, since no single one of them, or even a grouping of them, seems to provide a guarantee that a library will attain a culture of assessment, the results do not offer a prescription for developing a culture of assessment. The results do, however, bring clarity to understanding how different factors are related to one another and also offer the insight that administrators or front-line leadership can be influential in culture development. Librarians wishing to develop a culture of assessment in a community college library can pursue such culture development through any of the factors within their sphere of influence.

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Endnotes

2. Description of the literature that served as the basis for the survey instrument, please see

3. We are interested in continuing to use this instrument in additional settings (e.g., other countries or adapting the method to investigate perspectives within a specific library or library system) and welcome inquiries about potential partnerships.


5. This factor was only asked about for respondents of those libraries where a campus-wide assessment initiative existed.
Abstract
The Institute for Research Design in Librarianship (IRDL) is a continuing education program designed to help academic and research librarians improve their research skills and increase their research output. Funded by a grant from the Institute of Museum and Library Services (IMLS), the centerpiece of the project is a nine-day workshop on research design each summer for three years, 2014–2016. Twenty-one participants each year will leave the IRDL with increased knowledge of research skills and with a viable research proposal to be conducted during the following academic year. Project assessment is carried out each of the three years with input from an internal assessment team, the co-investigators, and an external reviewer. The four-part assessment plan includes scoring each research proposal pre- and post-IRDL workshop; social network analysis; mastery of curriculum content; and research confidence, measured by a confidence scale administered immediately before the workshop and at the end. The confidence scale is a revised and expanded version of a scale used with respondents to a survey conducted by two of the researchers in 2010.

Introduction
The Institute for Research Design in Librarianship (IRDL) is a continuing education program designed to help academic and research librarians improve their research skills and increase their research output. It builds on more than two decades of scholarship surrounding the importance of academic librarian research and the challenges facing librarians who want and/or need to conduct research. For the purpose of this project we define research broadly to include theoretical research, designed to advance knowledge in the field of library and information science, often conducted by “academic researchers,” and operations research, designed to inform decision making, often conducted by “practitioner-researchers.” Project co-directors Kristine Brancolini and Marie Kennedy used the following working definition of research; it was included on the survey instrument that serves as the basis for the needs assessment that informed the development of IRDL:

The process of arriving at dependable solutions to problems/questions/hypotheses through the planned and systematic collection, analysis, and interpretation of data: it may be applied or theoretical in nature and use quantitative or qualitative methods. (This definition does not include library research that is limited to activities such as compiling bibliographies and searching catalogs).²

In order to understand how academic librarians describe their own research design backgrounds, rate their own confidence levels in performing the discrete tasks of a research project, and report on institutional support for research, Brancolini and Kennedy designed and administered a national survey, targeting academic librarians. The survey was launched in early December 2010 via distribution lists and gathered over 900 responses. The results confirm uneven prior training in research design, varied levels of confidence in the steps of the research process, and uneven support at their institutions.³ Based on these findings, Brancolini and Kennedy received funding from the Institute of Museum and Library Services (IMLS) Laura Bush 21st Century Librarian Program grant for three years, 2014–2016, to create the Institute for Research Design in Librarianship (IRDL),³ a training opportunity that supports those three areas of need. Specifically, IRDL is designed to provide the conditions for research success:
• Foster an environment of collegiality and support in the research process
• Provide instruction in areas needed to complete the research design for a project developed by each participant
• Encourage the dissemination of research through publication or presentation
• Instill confidence in institute scholars about the research process by providing clear instruction on each step

The centerpiece of IRDL is a nine-day summer research workshop held on the campus of Loyola Marymount University in Los Angeles. The first of three annual workshops was held June 15–26, 2014. The target audience for IRDL is self-described novice researchers, who hold an appointment in an academic or research library in the United States. Eighty-seven academic and research librarians from across the country submitted applications for this first cohort. An inclusive advisory board and the IRDL co-directors selected 25 participants, with broad representation across types of academic library, job titles and functions, race and ethnicity. Each applicant submitted a draft proposal for a research project to be completed during the 2014–2015 academic year. During the summer workshop, two faculty members—one an anthropologist/researcher who has conducted similar training workshops, the other a professor and prolific scholar from the School of Information at San Jose State University—provided instruction in various aspects of the research process and consulted with participants individually to help them revise their proposals. One month after the workshop ended, each participant re-submitted their revised proposals, which became the basis for one of the program assessments.

**Assessment of IRDL**

Multiple assessments of the institute’s effectiveness have been incorporated into the project plan. The co-directors and instructors use the assessment findings to guide revisions for the subsequent years. Assessment focuses on the effectiveness of the entire program, with special emphasis on summer workshop, the follow-up communication with IRDL participants, and their communication with one another. The assessment plan has four parts:

1. Scoring research proposals pre- and post-IRDL workshop, completed July 28–29, 2014
2. Social network analysis, based upon a questionnaire administered at four times throughout the cohort year
3. Mastery of curriculum content, based upon pre- and post-tests throughout the workshop
4. Research confidence, based upon a questionnaire administered right before the workshop began and at the end

An external reviewer from Colorado State Library was on site for three days for the first year of IRDL. She observed workshop instruction and interviewed instructors and participants. The focus of the interviews was participants’ perceptions about factors that contribute to learning, workshop outcomes, and suggestions for improvement. The co-directors surveyed all IRDL scholars in late July, incorporating feedback from the external reviewer in the design of the survey.

**Research Confidence**

One factor that might lead to the research success of a librarian is confidence. The researchers posed the following question: Did participation in the IRDL Summer Workshop 2014 increase the confidence of participants with regard to completing the steps in the research process? Psychology research suggests that self-efficacy (confidence) might be an important factor in encouraging academic librarians to undertake research and in their success in completing research and disseminating the results. There is ample psychological research in the area of perceived self-efficacy—“people’s beliefs about their capabilities to produce effects”—related to work-related performance and achievement. Assuming that Bandura’s idea of reciprocal determinism is correct, we expected that the confidence of academic librarians in their ability to perform discrete tasks in a research process, along with environmental factors (hence the survey questions about demographic data), would be related to behavior (that is, conducting/disseminating research).

Brancolini and Kennedy included questions on research confidence in their 2010 survey of academic librarians; the questionnaire appears at the end of their 2012 article. Based upon Bandura’s theory of self-efficacy, we predicted that confidence in their ability to conduct research would correlate with success in completing research on the part of academic librarians. In Q10 of the questionnaire respondents were asked to rate their confidence in performing the discrete steps in a research project on a scale of 1 to 5, with 1 being “not at all confident” and 5 being “very confident.” We measured ten discrete steps: turning your
topic into a question that can be tested; designing a project to test your question; performing a literature review; identifying research partners, if needed; gathering data; analyzing data; reporting results in written format; reporting results verbally; determining appropriate format for disseminating results (poster/presentation/article); identifying appropriate places to disseminate results (publication/conference).

We expected that whether or not an academic librarian had conducted research since completing a LIS degree would be associated with how confident the librarian felt in performing the discrete steps of a research project. To test this association, we created two variables: Average Confidence and Conduct Research. Average Confidence was constructed from Q10, as noted above. Conduct Research was constructed from Q7, which asked if the participant had conducted research since completing a library or information science (LIS) master’s degree, giving an optional response for “n/a (Do not have an LIS master’s degree).” We removed responses to this question from respondents who did not have an LIS master’s degree, leaving behind only those cases that have a yes/no response to the question, “Have you conducted research since you completed your library or information science (LIS) master’s degree?” We found by running a logistic regression in SPSS 16.0 using the enter method that a significant model emerged: $F_{1, 792} = 111.174$, $p = 0.000$; adjusted R-squared = .122. The predictor variable Confidence has a Beta = -.351 and $p = 0.000$. This suggested that confidence in performing the discrete steps in a research project may be useful as a predictor for whether or not an academic librarian conducts research. IRDL 2014 provided the opportunity to further advance the use of this confidence scale. Before we used the scale again we evaluated its validity through an exploratory factor analysis to determine the relationships between constructs, to identify which items on the scale were correlated and could appropriately represent specific dimensions of research confidence.

**Exploratory Factor Analysis**

We evaluated the confidence scale to determine if all of the components we identified indeed held together statistically as part of the whole process of “research.” The first step was to determine the validity of the ten-item confidence scale. In 2014 Chavez ran an exploratory factor analysis (EFA) using the original ten-item research component confidence scale. It was determined that the sample size (n=816) is large enough to conduct an EFA. Using the Kaiser-Mayer-Okin Measure of Sampling Adequacy and the Bartlett’s Test of Sphericity, it was also determined that the data are suitable for factor analysis.

**Method**

As the factor structure of the confidence scale was uncertain, exploratory factory analysis was chosen as the most appropriate method (rather than confirmatory factor analysis). Both principal component analysis and principal axis factoring with varimax rotation were performed, and several methods, including investigation of scree-plots, Kaiser’s eigenvalue criterion, and theoretical insight, were used to investigate the confidence scale. Finally, Cronbach’s alpha was used to measure internal consistency of the scale.

**Results**

Chavez found a three factor solution, with the above two items removed, to be the ideal solution. The three factors measure the following constructs: planning phase, data phase, and reporting phase of the research process. These three factors cumulatively explain approximately 80 percent of the variance. The items “performing a literature review” and “identifying research partners, if needed” performed poorly. Factor loadings for these items suggested that the items should be removed from the confidence scale. In addition, after removing both items, Cronbach’s alpha for the eight-item scale (0.898) and the alpha for each factor (Planning=0.876, Data=0.834, Reporting=0.860) indicates a high level of internal consistency. The analysis pointed to areas of improvement for the scale:

1. **Deletion or revision of the “performing a literature review” item.** The item is vague and could be improved by breaking it down into more specific aspects. For this reason, Chavez recommended that the question be revised for future use.

2. **Deletion or revision of the “identifying research partners, if needed” item.** This item may not have contributed much to the overall measurement of research confidence, as it is not a necessary step in the research process, as many conduct research without partners. For this reason, Chavez recommended that this
item be deleted or measured separately from this scale.

Revised and Expanded Research Confidence Scale
Based upon the results of the factor analysis, we deleted the item related to identifying research partners and revised the item related to performing a literature review in order to capture the components of this complex step in the research process. Since we had evidence that the scale measures valid constructs, we decided to further break out other steps in the process. We wrote additional questions intended to fit the three factor solution and decided to use the revised and expanded research confidence scale with the first cohort of IRDL Scholars in June 2014.

Method
The twenty-five 2014 IRDL Scholars completed the revised and expanded version of the confidence scale a few days before the summer research workshop began and immediately after it ended. This version of the scale asked thirty-eight questions in eight categories, with at least two questions in each category. These eight categories conform to Chavez's three factor solution:

1. Planning
   • Turning a topic into a question that can be tested (three questions)
   • Designing a project to test your question (six questions)
   • Performing a literature review (five questions)

2. Data
   • Gathering data (eleven questions)
   • Analyzing data (five questions)

3. Reporting
   • Reporting results written (four questions)
   • Reporting results verbally (two questions)
   • Determining appropriate reporting (two questions)

The questionnaire uses a five-point Likert scale to report respondents' confidence in completing the steps in the research process, with 1 being “not at all confident” and 5 being “very confident.” We administered the expanded confidence scale to each of the 25 IRDL scholars just before the 2014 workshop began and again at the end of the workshop, following nine days of instruction and mentoring.

Results
IRDL scholars scored significantly higher on the confidence scale after the workshop. The means across all 25 participants were Time 1 (immediately before the IRDL workshop) = 91.16 and Time 2 (on the last day of the IRDL workshop) = 144.52. The paired samples t-test was significant at p < .00005 (SPSS reports this as .000). We expected that overall confidence would have increased for the participants, but we wondered what the scores of the individual questions may reveal. We were interested to learn where participants experienced the greatest increases in confidence. We examined the data for Time 1, immediately prior to the IRDL workshop, Time 2, immediately after the IRDL workshop, and compared the means for each question between Time 1 and Time 2.

Time 1. Using the scale measurements, with 1 being “not at all confident” and 5 being “very confident,” the scores at Time 1 on individual questions ranged between 1.28 and 3.8. The lowest average score was for Q5.4: Knowing which statistical test(s) to run. The four other questions with the lowest results and their average scores include:

- Q5.3: Identifying which statistical package may assist you in analyzing your data (1.44)
- Q4.9: Knowing how to run a focus group (1.56)
- Q4.8: Knowing how to design a focus group (1.64)
- Q4.3: Determining how many members of a population to include in your study (1.68)

Two questions tied for the highest average score (3.88): Q3.4: Using relevant keywords to discover literature about your research topic; and Q6.3: Knowing how to apply a style guide. The three other questions with the highest results and their average scores include:

- Q3.3: Identifying appropriate information sources in which to conduct your literature review (3.52)
- Q3.5: Determining if a piece of literature is an appropriate source for your research question (3.44)
- Q7.2: Knowing how to adapt your written research paper for an oral presentation (3.12)

Time 2. At Time 2 the average scores on individual questions ranged between 2.72 and 4.48. The lowest average score at Time 2 was on the same question as at Time 1, 5.4: Knowing which
statistical test(s) to run. However, the average increased from 1.28 to 2.72. It was the only average score at Time 2 below 3 (moderately confident). The highest average score was on Q3.4: “Using relevant keywords to discover literature about your research topic,” which was one of the two highest scores in Time 1.

Comparisons between Time 1 and Time 2. None of the question averages were above 4 on Time 1. However, for Time 2 ten questions had average scores above 4, in addition to Q3.4 noted above (with change in average noted in parentheses):

- Q6.3: Knowing how to apply a style guide (APA or MLA, for example) (3.88 to 4.4)
- Q3.3: Identifying appropriate information sources in which to conduct your literature search (3.52 to 4.28)
- Q3.5: Determining if a piece of literature is an appropriate source for your research question (3.44 to 4.4)
- Q7.2: Knowing how to adapt your written research paper for oral presentation (3.12 to 4)
- Q1.1: Turning your topic into a research question (2.96 to 4.08)
- Q1.3: Determining if your research topic makes a contribution to the field, based on the relevant literature (2.8 to 4.24)
- Q2.2: Identifying other research studies similar to yours in order to examine the methods used (3 to 4.4)
- Q2.3: Exploring research designs that are appropriate for your question (2.28 to 4.24)
- Q3.2: Determining how your study can contribute to the existing literature (2.92 to 4.04)
- Q6.2: Knowing the components to construct a traditional social sciences journal article (2.32 to 4.16)

Discussion
The librarian research confidence scale, first developed in 2010, tested via exploratory factor analysis in 2014 and revised and expanded in 2014, provided interesting and useful data for the first 25-member cohort of the Institute for Research Design in Librarianship (IRDL). The results of the pre- and post-IRDL confidence measures indicate that the nine-day research design workshop, using a model often called a “boot camp,” significantly increased participants’ confidence in the research process overall, with increases in the means on each of the 38 questions.

Data from the confidence survey reinforce qualitative data gathered during the assessments of IRDL 2014, including interviews conducted by the external reviewer. We anticipated that even after IRDL participants would feel a relative lack of confidence in the use of statistics for data analysis, which was confirmed by the average scores on the scale. We had already determined that this is an area in which many academic librarians lack education and training, and thus, lack confidence. On the positive side, we were pleased to learn that confidence in conducting a focus group increased from an average score of 1.56—one of the lowest pre-IRDL—to 3.80, which was the greatest increase from Time 1 to Time 2. The IRDL workshop included instruction on planning and conducting focus groups and hands-on experience in conducting a mock focus group, with various participants playing different roles. However, we have a few unanswered questions related to the components of the research process that our scale intends to measure. We plan to conduct further data analyses to determine which components produced statistically significant results between Time 1 and Time 2 for this and future cohorts of IRDL. We also intend to disaggregate the data resulting from this scale to determine which steps in the research process continue to score low post-IRDL for at least some of the participants. All of these results will influence the revision of the curriculum and other institute-related activities for future workshops. Our desire is for every IRDL participant to leave the workshop with a score of 4 (confident) or 5 (very confident) on each of the 38 questions of the research confidence scale. We will continue to test the scale for the duration of IRDL and will eventually conduct analyses to determine if research confidence was a predictor for the completion of their research projects for IRDL participants.

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Endnotes


4. For details about IRDL, see the project website: http://irdlonline.org.


8. Ibid., 434.

Getting to Know You (and Me!): Assessment and the Archival Metrics Toolkit at Columbia University’s Rare Book and Manuscript Library

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Abstract
In the past decade, the interest in library assessment has expanded greatly—particularly as a method to gather evidence and context for strategic planning and decision making. As has been the case with our counterparts across the nation, assessment of the quality and effectiveness of services and collections has grown exponentially at Columbia University Libraries (CUL). While campus-wide LibQUAL+® surveys have been administered since 2003, a user-based evaluation of the RBML had never been conducted before. LibQUAL+ surveys have been useful in generating broad feedback on a wide range of library activities, but they do not adequately assess the patron needs and service delivery for special collections and archives. Recognizing this problem, we decided to implement a survey to gain insight into the highly specialized needs of archives and special collections users.

To conduct this assessment we adapted the Researcher Questionnaire from the Archival Metrics Toolkit. Between September 1, 2011 and August 30, 2012, the Rare Book and Manuscript Library (RBML) staff distributed the paper survey to any new researcher who came to our reading room as well as to returning researchers who had not been here since the start of the survey period. The survey was distributed to 910 researchers and completed by 566, a response rate of 62%.

The survey findings verified anecdotal evidence about the shortcomings of the reading areas, as well as the highly favorable way in which patrons view the staff that works with them at all levels. Results highlight the value of archives as a community outreach mechanism for the university, as well as demonstrate the university’s mission of providing a distinctive and distinguished learning environment. Our recent implementation of the web-based Aeon registration and request system will most certainly impact any future assessment initiatives undertaken by the RBML.

Purpose
Established in 1930, The Rare Book and Manuscript Library (RBML) is Columbia University’s principal repository for primary source collections. The range of collections span more than 4,000 years and comprise medieval and renaissance manuscripts, cuneiform tablets, papyri, art and realia, some 500,000 printed books and 14 miles of manuscripts, personal papers, and records. The collections of the RBML are open for use by all members of the university community and the public.

In the past decade, the interest in library assessment has expanded greatly—particularly as a method to gather evidence and context for strategic planning and decision making. As has been the case with our counterparts across the nation, assessment of the quality and effectiveness of services and collections has grown exponentially at Columbia University Libraries (CUL). Over the past several years, library staff at Columbia has been collecting and analyzing an array of quantitative data, including card swipe access, reference transactions, and circulation statistics, in an attempt to understand library visit patterns and collection use. Since 2003, campus-wide LibQUAL+® surveys have been administered to measure student and faculty perceptions of library service quality and to solicit feedback. LibQUAL+ surveys have been useful in generating broad feedback on a wide range of library activities, but they have not adequately assessed the patron needs and service delivery for special collections. As indicated in an article by Dupont, et al., special collections and archives contribute unique value to research and learning, but their value has not been effectively communicated due to a lack of standardized tools to assess their impact. Recognizing this problem, the RBML decided to implement a survey of its own to gain insight into the highly specialized needs of archives and special collections users. While the establishment of the department dates back to 1930, a user-
based evaluation of the RBML had never been conducted before.

**Project Creation**

The idea of an RBML specific assessment project was approved by CUL administration and, in January of 2011, a working group of five RBML staff members, led by the CUL assessment librarian, was formed to figure out how best to proceed. To prepare for the project the group began by conducting a review of the current literature in both library assessment and user satisfaction studies more generally to understand the shape of the field and to see what other institutions were doing and how they were using their findings. Among the most influential readings was an article entitled “The Development, Testing, and Evaluation of the Archival Metrics Toolkits,” reporting on the Archival Metrics Project, which tested and evaluated a set of toolkits designed to conduct user-based evaluation in college and university archives and special collections.

In addition to background reading the group also undertook training on conducting research on human subjects and sought project approval from Columbia University’s Institutional Review Board (IRB). At Columbia, the surveys we anticipated distributing to our patrons are considered a form of human “testing” and if we wanted to have our project approved by the IRB board, and be able to share our results publicly, we had to be formally trained in the protocols of human testing. Once background reading and institutional requirements were completed we began asking ourselves what we wanted to learn from the project, what our concerns were, and what we ultimately wanted to do with whatever information we gathered.

To do so, the group undertook a series of exercises, which forced an articulation of specific goals and needs. Our small working group generated 67 individual “information needs” for the RBML during this planning phase, ranging from simple questions such as, “Who are our users?” and “How did they find us?” to more specific questions such as, “Do you think the desk staffing is adequate?” and “What do you think of the condition of the collections?” We compiled our answers onto a brainstorming worksheet, and then polled the RBML staff and library administration to determine what information other critical stakeholders wanted to gain from such an undertaking. It was very important that all of our stakeholders had a sense that they would gain something from the project, and this helped give all staff members and administrators a sense of investment in the project and its outcomes.

We aggregated all of the information needs that we had identified in our various brainstorming sessions, ranked them, grouped them into broader categories, and prioritized these into a manageable subset of information needs. Through this process we identified the following goals for our evaluation project:

- Assess RBML’s performance in support of CUL/IS strategic plan goals, especially supporting teaching and learning; supporting research; building and describing collections; and discovery, access, delivery, and service.
- Support the libraries’ commitment to assessment, by using a tool that would help inform our decision making, evaluate our service, monitor our effectiveness, and aid in thinking strategically for the future.
- Understand our patron needs, motivation, and expectations; demonstrate our value and impact; inform our planning and decision making; and support changes that benefit our patrons.
- Build the culture of assessment into RBML in a programmatic, repeatable way, using a standard tool that would allow us to compare to other intuitions.

Once we knew what our goals were, we could then figure out if we could meet any of them through analyzing data already at our disposal. Our data collection practices at the time were, admittedly, haphazard. We had done some user testing on our finding aid design when we implemented Encoded Archival Description (EAD), so had a sense of how users responded to online finding aids, but not to any of our other descriptive tools. Similarly, we did have some collection use data available to us in the form of web analytics, ad hoc reference tracking, and an in-house database that tracked reading room use, but it was scattered and hard to interpret. One thing we very clearly did not have was information about patron demographics and user satisfaction.

After examining these existing data sources, analyzing the feedback from staff, and continued discussions among the members of the working
group, it was decided that the easiest way to proceed was to work with the existing “Archival Metrics Researcher Questionnaire” created as part of the larger Archival Metrics Toolkit that was jointly developed by University of Michigan, the University of North Carolina-Chapel Hill, and the University of Toronto. By adjusting the questions slightly to reflect specific information needs of the RBML, we quickly realized the broad service categories addressed by this survey—understanding users’ evaluation of staff, discovery tools, and experience using the library itself—overlapped enough with the questions we wanted to have answered to make it a worthwhile option. Additionally, using a standardized, pre-validated tool also meant that we did not have to formulate, test and validate a survey ourselves—which would have considerably lengthened the timeline of this project. It also provided us with the option to more easily share and compare our results with other institutions that might be using the same tools.

Methodology
The “Archival Metrics Researcher Questionnaire” survey form is divided into six distinct sections: use of the repository (RBML), staff, services and facilities, feedback on your visit, background information, and general feedback. There are a total of 22 questions asked, the majority of which are closed-ended questions, though there are several open-ended questions throughout the questionnaire to allow for more specific feedback.

This study relied on visiting researchers who volunteered to participate in the project. Only patrons over 18 years old were included to insure IRB standards were met. Between September 1, 2011 and August 30, 2012, the RBML staff distributed the paper survey, printed on vividly colored paper, to any new researcher who came to our reading room as well as to returning researchers who had not been here since the start of the survey period. Researchers filled out the survey only once, even if they were repeat visitors. It was up to the patron whether they completed the form during that initial visit or at a later date. While the original plan had been to provide every unique visitor with an assessment form, logistics, staffing, high demand, and other variables conspired to make that goal unattainable. The survey was conducted over a yearlong period because of the many different cycles of researchers throughout the year at the RBML. It was decided that a full year of feedback would give us a sufficient baseline for any future assessment efforts, though we anticipate that any future efforts will not be conducted over such long a period of time.

Handing out these paper surveys yielded an incredibly high response rate. During the data collection period, 5,627 visits and 1,545 unique visitors were registered. The survey was distributed to a sample of 910 researchers and, of those, 566 researchers participated in the survey. The overall response rate for the survey was 62%, although the response rate at the item level varied as noted in the findings. To the best of our knowledge, this is the largest sample size collected using this questionnaire, providing a confidence in the breadth and depth of our results.

Findings and Discussion
The key findings indicate that a broad range of patrons from across the university and the general public use the RBML’s collections. The RBML staff is ranked as excellent in delivering service—they are helpful, efficient, available, approachable, and knowledgeable. Overall, a substantial number of visitors are completely satisfied with the facilities, services, and staff of the RBML, but key areas for improvement are increasing hours and upgrading the overall environment in the reading rooms (e.g., temperature, noise, space, comfort, etc.).

Below, we provide our findings in detail from selected sections of the survey and discuss their practical implications for the RBML.

Background information
In the survey there were several demographic questions that helped us learn more about the on-site researchers and interpret results in a meaningful way. In response to the question, “are you affiliated with Columbia University?” we learned that the majority of the researchers were non-affiliates. Sixty-three percent of the researchers indicated that they were not affiliated with the university, and 37% of the researchers indicated that they were affiliated with Columbia University. The high number of non-Columbia researchers communicates the value of archives as a community outreach mechanism for the university.
The responses to the question, “Which best describes your position?” revealed that the researchers include a student majority (53%), followed by faculty member or post-doc, and then university staff or members of the public (see Figure 1 for details). The high number of graduate and undergraduate students speaks to the university’s mission of providing a distinctive and distinguished learning environment.

**Figure 1: Result summary for question, “What describes your position?”**

Responses to the question, “How many times have you used the Rare Book and Manuscript Library,” indicate that the patrons are newer and younger than commonly thought: 74% were first-time users of RBML, and 50% of those were under 40 years old.
Figure 2: Result summary for question, “How many times have you used the Rare Book and Manuscript Library?” (n=514)

We also learned about our researchers’ level of experience in using archival materials. Thirty-two percent of researchers indicated that they have been using archives more than five years while 31% indicated that they were using archival materials for the first time. The high number of researchers using the archives for the first time speaks to the learning mission of the organization, and it also helps us assess training needs.

Figure 3: Result summary for question, “How long have you been using archival materials?” (n=512)
Use of the RBML
The survey began with an open-ended question that solicited responses from researchers about their research topic (i.e., “What question or interest brings you to the Rare Book and Manuscript Library?”). Proper data analyses for open-ended question responses can be quite complicated, labor intensive, and time consuming. Although we did not utilize a procedure known as “coding” to group responses into common themes, a word cloud based on most frequently used words helped us understand more fully the nature (by subject/field) of projects worked on by researchers and their relationship to our collections.

Figure 4: Word cloud based on frequency of response words for open-ended question “What question or interest brings you to the Rare Book and Manuscript Library?”

The majority of visitors who completed the survey indicated that they were working on a publication (e.g., article, book, etc.). Figure 5 shows eight broad project types included in the survey as selections, and respective response numbers and percentages for each selection. Nine percent of visitors have indicated that their projects were not covered by the choices given above. Following are examples of “other” projects that motivated a visit to the RBML: “Education video game,” “translation project,” “personal interest,” “general interest,” “student government,” “oral history CCNY,” “curiosity,” “looking for materials for upcoming exhibitions,” “National Historic Landmark Nomination,” “audition,” “just for fun,” and so on.
Figure 5: Result summary for question, “Which best characterizes the project that motivated this visit to the Rare Book and Manuscript Library?” (n=564)

Services and facilities
Overall, a substantial number of on-site researchers (98%) indicated that they were highly satisfied with the facilities, services, and staff at the RBML. Table 1 shows, by average scores from highest to lowest, the rank staff received from visiting researchers in five areas.

Table 1: Result summary for question, “Please provide feedback on our staff on a scale from 1 (poor) to 5 (excellent).”

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>No Opinion</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of the staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helpfulness of the staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency of staff in retrieving materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that 151 respondents selected “no opinion” option for “subject knowledge of the staff.” Hence, the validity of this item may be low. The high percentage (28%) of “no opinion” for this item could be due to a genuine lack of opinion or item ambiguity, but we know from experience that many researchers go directly to collections they have identified without engaging staff subject matter experts. These unmediated interactions are the norm among many experienced special collections patrons.
Table 2: Level of satisfaction with facilities and services

<table>
<thead>
<tr>
<th>Questionnaire items</th>
<th>1 (completely dissatisfied)</th>
<th>5 (completely satisfied)</th>
<th>No opinion</th>
<th>Response count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study areas</td>
<td>0%</td>
<td>4%</td>
<td>16%</td>
<td>72%</td>
</tr>
<tr>
<td>Noise level</td>
<td>0%</td>
<td>2%</td>
<td>6%</td>
<td>21%</td>
</tr>
<tr>
<td>Furniture</td>
<td>1%</td>
<td>3%</td>
<td>4%</td>
<td>18%</td>
</tr>
<tr>
<td>Physical Access to the building</td>
<td>0%</td>
<td>1%</td>
<td>7%</td>
<td>18%</td>
</tr>
<tr>
<td>Lighting</td>
<td>1%</td>
<td>3%</td>
<td>8%</td>
<td>21%</td>
</tr>
<tr>
<td>Informational/ navigational signs</td>
<td>0%</td>
<td>2%</td>
<td>8%</td>
<td>20%</td>
</tr>
<tr>
<td>Temperature</td>
<td>2%</td>
<td>5%</td>
<td>12%</td>
<td>20%</td>
</tr>
<tr>
<td>Internet access</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
<td>7%</td>
</tr>
<tr>
<td>Hours of service</td>
<td>1%</td>
<td>5%</td>
<td>16%</td>
<td>26%</td>
</tr>
<tr>
<td>Website</td>
<td>0%</td>
<td>1%</td>
<td>6%</td>
<td>21%</td>
</tr>
<tr>
<td>Catalogs/ indexes/ findings aids</td>
<td>0%</td>
<td>2%</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>Exhibits</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>10%</td>
</tr>
<tr>
<td>Reference books</td>
<td>0%</td>
<td>0%</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Photocopying / duplication services</td>
<td>1%</td>
<td>2%</td>
<td>2%</td>
<td>5%</td>
</tr>
<tr>
<td>Microfilm and fiche viewing facilities</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Feedback on your visit
Seventy percent of researchers reported that they accomplished what they set out to do, and 39% of researchers said that they learned something new about the source materials on their topic/area of interest.
Conclusion

Overall, this was a good first step in implementing an iterative assessment plan that can help us better understand RBML patrons, their needs, and gauge the effectiveness of our collections and services. The survey findings verified anecdotal evidence about the shortcomings of the reading areas, as well as the highly favorable way in which patrons view the staff that works with them at all levels. The high number of non-Columbia researchers communicates the value of archives as a community outreach mechanism for the university, just as the high number of researchers using the archives for the first time speaks to the learning mission of the organization.

But probably one of the most important results of this project is the institution of a formal culture of assessment at the RBML, which continues to influence how the RBML staff goes about its work. This culture of assessment has certainly played a role in our staff’s acceptance and use of new standardized tools such as Aeon (a web-based registration and request system providing us with far more accurate data concerning reading room visitors, visitor demographics, and collection use) and Desk Tracker (a system used throughout the Columbia University Libraries to track non-reading room reference interactions and class sessions). These tools, while imperfect, are allowing our statistics to become more and more standardized, giving us the numbers our library administration wants to see and allowing us to methodically change the way we think about and serve our patron base. Whether these new tools obviate the need for formal assessment surveys like the one we used in 2011–2012 is still to be decided, but they will most certainly influence what kind of assessment will be necessary as we move forward.

An extraordinary amount of work and support, both from within our unit and from others within the library, was required to see this assessment project through to its successful conclusion. But in spite of the challenges of tackling such a large project, it was ultimately a very worthwhile exercise and has given us a much clearer sense of who our patrons are and how best we can meet their needs.

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Notes
1. Since 2007, students, faculty, and staff at Columbia University Libraries have been required to swipe their ID cards in order to enter the library buildings where the card swipe system is installed. Although the card swipe system operates primarily as a security measure, each swipe of a card presents the libraries with an accurate, continuous, and objective picture of library users.

2. LibQUAL+ is a web-based survey. This survey is created and maintained by the Association of Research Libraries (ARL). For more information see: http://www.libqual.org/about/about_lq/general_info.

3. Christian Dupont and Elizabeth Yakel, “‘What’s So Special about Special Collections?’ Or, Assessing the Value Special Collections Bring to Academic Libraries,” Evidence Based Library and Information Practice 8, no. 2 (June 11, 2013): 9–21.


5. See Archival Metrics Researcher Toolkit at http://archivalmetrics.cms.si.umich.edu/node/5.

Beyond the Cabinet of Curiosities: Demonstrating the Impact of Special Collections Instruction

Julia Gardner and Leah Richardson
University of Chicago, USA

Abstract
Active learning is a well-established concept in library instruction and has since become prominent in the special collections arena. Public services librarians at the Special Collections Research Center of the University of Chicago Library embraced this model in their instruction sessions and perceived this approach as successful. A survey was sent to faculty who bring their classes to special collections in order to assess the actual effectiveness of this direction for the instruction program and to learn how faculty perceive the value of special collections instruction. The survey results confirmed an active learning instruction approach, and showed that faculty value the research skills and information students receive in special collections instruction. The results also provided information about what elements of the physical classroom environment were most important to instructors.

Introduction
The Special Collections Research Center at the University of Chicago Library (SCRC) is responsible for approximately one-third of all University of Chicago Library instruction. For the past three fiscal years there have been 100 distinct classes held each year in the department, in over 200 sessions. In FY14 over 2,000 students attended an instruction session in SCRC. Of the total University of Chicago undergraduate population, roughly one in five students received special collections instruction. While the instruction program numbers have been consistently high, there has not been a correspondingly high level of assessment. Indeed, there had not been any systematic assessment of SCRC instruction since 2005. To address this oversight, a survey was administered to faculty that aimed to gauge the quality of SCRC instruction services and spaces.

Past assessment of instruction surveyed the students, using a generic assessment form developed in the University of Chicago Library's Committee on Instruction and Outreach (CIAO). While useful in terms of general feedback, this assessment was not systematic and did not allow examination of instruction in SCRC beyond providing a snapshot of what students found most and least helpful in their visits. SCRC librarians were particularly interested in learning how faculty perceived their students’ facility with primary source research and use following class instruction, and sought to design questions that would capture what instructors asked their students to do, what kinds of instruction they requested, and in what ways working in Special Collections affected students’ research and writing. In addition to questions about instruction, the survey also asked whether classroom spaces met the needs of faculty in terms of physical resources and technology and if faculty were incorporating (or wanted to incorporate) newer technologies or software for teaching that were not currently supported.

Literature Review
This assessment project is situated within a growing body of literature regarding special collections assessment in general, and instruction in particular. It is now commonplace to hear of instruction programs in special collections that focus on critical thinking, active learning, and attempt to move beyond the show-and-tell model. At the time of this writing it is safe to say that student-centered methods have been wholeheartedly embraced by special collections professionals who conduct instruction. The literature is full of accounts that support in-depth primary source instruction and outline successful special collections instruction programs and methods. Observational evidence based on the librarian or archivist perspective, often in the form of a case study, provides anecdotal support for more robust instruction methods in special collections. Marcus Robyns writes persuasively in his 2001 article “The Archivist as Educator: Integrating Critical Thinking Skills into Historical
Research Methods Instruction,” about the empowering effects of primary source instruction in general and how special collections instruction specifically impacts the critical thinking movement in higher education.¹ Robyns ties new models of primary source instruction to specific psychological theories of learning and teaching and reports on a workshop taught in the archives at Northern Michigan University that employs the “archives as lab” model and focuses on teaching critical thinking skills.

Peter Carini promotes a similar agenda in his 2009 article, arguing for a model of special collections instruction that departs from standard bibliographic instruction models and reinforces the “archives as lab” concept.² He also outlines a useful set of competency standards from which to design appropriate learning outcomes for special collections instruction. The article focuses on developing approaches to special collections instruction rather than on methods for assessing instructional outcomes.

The era of assessment is now upon us. As Anne Bahde and Heather Smedberg point out, “the tough economic times have spurred libraries into a flurry of assessment activities, as administrators have been increasingly pressured to show demonstrable returns on investments of time and money.”³ Now that a more comprehensive approach to special collections instruction is widely-established, a similar commitment is needed for assessment of these activities. Christian DuPont and Elizabeth Yakel are advancing the conversation with practical suggestions to create consistency for assessment across repositories. They identified challenges facing special collections assessment at the 2010 Library Assessment Conference and published their study⁴ in Evidence Based Library and Information Practice in 2013. They recommend shifting from a collections-based to a user-centric approach in order to assess the impact of primary source use across reader type, in and outside the reading room, and across institutions. Their recommendations seek to establish a profession-wide culture of assessment and empower special collections professionals to embrace a new approach to measuring the impact of collections.

A great deal of attention is paid elsewhere in the literature to the numerous approaches to archival instruction assessment. Genya O’Gara, et al. asks if we are collecting the right data by measuring the important aspects of special collections instruction in the influential 2010 blog post titled “Articulating Value in Special Collections.”⁵ They ask, “how do we know if our instruction is making a difference for the researcher?” and consider what is being measured in order to determine the value of instruction: is it the skill of the presenter, the use of materials, or the number of students who attended the class? As part of their collaboration on the Association of Research Libraries’ (ARL) SPEC Kit 317: Special Collections Engagement, O’Gara et al. collected data from 124 ARL member institutions about how instruction was being assessed in special collections. The conclusions they draw echo the sentiments of DuPont and Yakel in that they also discovered inconsistencies in assessing special collections instruction. They found that the often simple metrics and ARL baseline statistics are typically the only data being collected and used to assess instruction. Further, they argue that these data are not meaningful enough to help librarians improve teaching practices. They conclude by calling on special collections professionals to develop “more appropriate evaluation methods” in order to gather more valuable data about the impact of special collections.

What does more valuable data look like? And what is the appropriate assessment method to gather useful data when it comes to instruction? A common approach to demonstrating the impact of special collections instruction is to collect the students’ perspective as seen in a 2014 study by Merinda Hensley et al.⁶ Looking to gain more insight into the effectiveness of primary source instruction on student learning outcomes and to move beyond using a brief survey at the end of a session, Hensley and colleagues at the University of Illinois at Urbana-Champaign collaborated with an instructional services librarian. Together they administered an online survey to students who attended archival instruction sessions about their perceptions of the session in general. They also conducted in-depth interviews with respondents who used the archives about their primary source research process overall. Responses were coded using the Archival Intelligence (AI) rubrics set forth by Deborah Torres and Elizabeth Yakel in their momentous 2003 article.⁷ This type of student-based response is extremely useful but is only half of the overall picture of effectiveness and impact of special collections instruction. The missing piece is the faculty perspective.
In fall 2012 an entire issue of RBM was devoted to assessment in special collections. Anne Bahde and Heather Smedberg in their aforementioned article review a number of formal approaches to special collections instruction assessment. These include surveys, citation analysis, rubrics, and observational assessment. They also include a discussion of approaches used in general library assessment. However, Bahde and Smedberg point out that course-embedded librarians and a strong faculty-librarian relationship are the best ways to fully measure student engagement with special collections materials in course assignments. Lisa Carter’s “Articulating Value: Building a Culture of Assessment in Special Collections” succinctly summarizes the call for more in-depth assessment of instruction in special collections and the need to partner with faculty. She writes, “We need to know and be able to demonstrate how well we are helping students to become better scholars… We can begin by partnering with faculty not only to establish curricular content and learning outcomes but also to determine how to measure the contribution of special collections to those outcomes.”

The study conducted by the University of Chicago Special Collections Research Center discussed in this paper builds on Carter, Bahde, and Smedberg’s work, and asks if the embedded special collections model is meeting faculty expectations. Rather than relying solely on students’ perceptions of their own skills, this survey asks faculty to report the skills they observe students gaining from special collections instruction, and to indicate the value of special collections instruction in relation to student engagement with primary sources.

Methodology
The survey was created using SurveyMonkey and distributed via e-mail to all University of Chicago instructors who used Special Collections to support their courses in the two years preceding the assessment. This included full-time faculty, adjunct instructors, and graduate student instructors, for a total of 80 individuals.

A 13-question survey instrument, using Likert scale and multiple choice options, as well as text boxes for free comment, was created in conjunction with the assessment librarian. After being reviewed by the library’s Assessment Planning Team, the instrument was submitted to the university’s Institutional Review Board and approved. The survey went live in June 2013 and closed in mid-August. The survey time was extended from the original plan to close it in July, and the reminder feature in SurveyMonkey was used to follow up with respondents who had either begun the survey and not finished it, or who had not completed it at all. The response rate was 61 percent, with 49 completed surveys. This response rate can be attributed to the repeated follow-ups, and to the well-established relationship that exists in many cases between Special Collections and those who teach in the space, which motivated instructors to complete the survey.

SurveyMonkey generated percentages from responses to multiple choice and Likert scale questions. Comments received in the open text questions were coded to sort them into thematic groups. For instance, comments in response to questions asking about types of student engagement with collections were sorted into the following categories: Written Papers, Class Presentations, and In-Class Activities. Comments responding to questions about the ways in which special collections instruction helped instructors achieve their teaching goals were also coded around common themes such as “physical interaction,” “historical context,” “disciplinary methodology,” or “concrete understanding.” While the survey asks about the uses of collections in relation to instruction, it is not focused on collection development per se.

Results and Discussion
Quantifying Types of Instruction Provided
Several questions sought to establish in what capacity a faculty member had used Special Collections for teaching, with particular attention to whether the class met for the entire quarter in SCRC, or came for what was described as a focused visit, typically one time, but sometimes leading to a repeat visit or two (see Figure 1). It was hoped that the results would also provide a sense of how many faculty did not schedule formal sessions in SCRC but directed students to use the collections, as each quarter SCRC receives visits from students who have been given such direction from a faculty member. Nobody in the survey group checked this option, so it would appear those who encourage or direct students to visit are not established Special Collections users.
The majority of visiting classes did receive some level of library instruction. In some cases, particularly with faculty who frequently teach in Special Collections, there is less librarian involvement (see Figure 2).

**Did a Librarian Provide Instruction for Your Class?**

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Yes</td>
<td>69.4%</td>
</tr>
<tr>
<td>No</td>
<td>30.6%</td>
</tr>
</tbody>
</table>

Nearly 80 percent of classes received at least a basic introduction to Special Collections and a demonstration of proper handling techniques (see Figure 3). Many classes also received more in-depth instruction, on a variety of topics. Approximately 67 percent of faculty requested instruction showing students how to find various formats of rare materials, from printed books to archival collections. About a third of respondents also indicated they requested a hands-on activity (beyond “how to find” types of activities) led by a Special Collections librarian, and that SCRC librarians provided instruction on the various ways one could interact with or use rare and archival materials as part of the research process. Half of respondents had class instruction focused on topic-specific research.

**What Kind of Instruction Did the Librarian Provide?**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to the department and proper handling demonstration</td>
<td>78.8%</td>
</tr>
<tr>
<td>How to find rare books, archives, etc.</td>
<td>66.7%</td>
</tr>
<tr>
<td>How to use (beyond proper handling) rare books, archives, etc.</td>
<td>33.3%</td>
</tr>
<tr>
<td>Librarian-led hands-on activity</td>
<td>30.3%</td>
</tr>
<tr>
<td>Topic-specific research guidance with or without activity</td>
<td>51.5%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>9.1%</td>
</tr>
</tbody>
</table>

**Student Use of Collections after Instruction**

In addition to understanding the types of instruction faculty desire from Special Collections librarians, the survey also had the objective of gathering information about what students did with rare materials after their class visits. A primary objective for the survey was to gain a sense of how many students whose classes visited Special Collections made use of the collections after that visit. Faculty were asked to indicate approximate percentages of students who used special collections materials for papers (see Figure 4). While responses to that question provided baseline information, the additional faculty comments in the free text box attached to this question provided a fuller sense of how and in what ways students were using collections. The comments were particularly helpful for understanding class use in cases where the instructor checked the “0–25%” option. If this faculty survey were to be repeated, the
percentage ranges for the lower use category would be adjusted, since the “0–25%” option makes it difficult to indicate if about a quarter of the class did use materials, or if none of the class did. Since this category was the most checked, it would be useful to parse it out to get a more accurate sense of use.

Combined, about 66 percent of instructors reported that up to half the class made use of collections after a visit (combining the first two categories). Thirty-four percent reported that over half the class used materials, with nearly 30 percent reporting very heavy use of the collections for papers. Several instructors noted in their comments that they required their classes to use SCRC materials for papers, which helps explain the number of responses in the “76–100%” category.

**Approximately what percentage of your students used primary sources from Special Collections in an assignment?**

**Figure 4**

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-25%</td>
<td>48.9%</td>
</tr>
<tr>
<td>26-50%</td>
<td>17.0%</td>
</tr>
<tr>
<td>51-75%</td>
<td>4.3%</td>
</tr>
<tr>
<td>76-100%</td>
<td>29.8%</td>
</tr>
</tbody>
</table>

**How Students Used SCRC materials**
The survey asked faculty to describe “how the use of primary sources enhanced student engagement with or understanding of the course topic.” Comments were coded according to the responses received. The most common ways in which faculty reported students using primary sources were for written papers, class presentations, in-class activities, and for more general introduction to working with primary sources/special collections materials.

**Haptic Knowledge**

In addition to learning more about how students used SCRC materials, this survey also sought to gain data indicating how faculty saw the pedagogical value of Special Collections instruction. Analysis of comments showed that one of the most-cited values instructors placed on special collections instruction was the ability it provided for students to physically interact with materials. Faculty often commented on the need to consult the original as an essential element of the class, or of the particular topic of study for the time they visited, either to enhance what they were reading or to provide necessary context. The importance of the physicality of the materials, and especially the importance of students being able to touch rare material, was frequently mentioned. At a time when access to digital facsimiles of primary sources is often assumed to be the most desired form of access, the faculty comments attesting to the value of the physical is important. Faculty spoke with great feeling about the value they placed on physical access and interaction, not just because the physical was different from the virtual, but in terms of how students gained different information—what might be termed a haptic knowledge—from physical encounters with rare materials.

Indeed, it was striking how frequently the comments included statements that a course “could not have been possible” or students “could not have understood” the topic without physical access to original objects. The comment section provided specific examples of what instructors felt to be the value of handling materials. For instance, a medievalist explained, “The opportunity to see and touch medieval manuscripts first hand allowed students to better understand the unique materiality of the transmission of text and image,” while a music instructor wrote that students in the class “were able to see, touch and describe the music we were studying in class. It gave them a concrete way to experience the ephemerality that is listening to music.” Instructors also repeatedly contrasted their experiences teaching with digital surrogates to teaching with the actual items in their comments, again emphasizing the primacy of physical access to the material object in achieving their teaching goals.
The Physical Environment
Finally, in addition to gaining information about instruction, the survey sought to collect information about what, if any, physical changes were needed to the department’s teaching spaces. The survey asked respondents to rank a list of elements present in the teaching spaces to indicate what was most valued and what was least important to their use of Special Collections for teaching. Perhaps not surprisingly, the collections were ranked most important. Among the physical elements in the rooms, the size of the projector and screen was ranked most important, with size of the room a close second. Internet access was ranked fourth, and the document camera fifth.

Most Desired Additions to the Teaching Spaces
Figure 5

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac operating system</td>
<td>52.2%</td>
</tr>
<tr>
<td>Laptop computers</td>
<td>17.4%</td>
</tr>
<tr>
<td>SMART Boards</td>
<td>37.0%</td>
</tr>
<tr>
<td>Whiteboards</td>
<td>34.8%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>30.4%</td>
</tr>
</tbody>
</table>

As shown in Figure 5, the most desired addition to the teaching spaces in Special Collections was to have a Mac operating system available. The library currently supports only PC equipment. Some respondents followed up on this choice in the comments, noting that they are most familiar with Apple computers. Respondents were about evenly split on desire for SMART Boards or whiteboards. Nearly as many respondents chose “Other” and listed options not included in the list as part of their comments at the end of the question. The remainder of the comments for “Other” indicated respondents chose that option because they were happy with the existing space and did not require any additional elements.

Uses of Technology in Teaching
Faculty were also asked about their preferred uses of technology when teaching in Special Collections. The questions included a mix of established, known elements such as CHALK (the university’s iteration of the course management system Blackboard) or simply the Internet, and newer programs such as Prezi as a presentation method. Respondents were asked to check all categories that they used (see Figure 6).

Figure 6

<table>
<thead>
<tr>
<th>CHALK</th>
<th>67.4%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library Research Guides (LibGuides)</td>
<td>43.5%</td>
</tr>
<tr>
<td>Social Media</td>
<td>4.3%</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>54.3%</td>
</tr>
<tr>
<td>Prezi</td>
<td>2.2%</td>
</tr>
<tr>
<td>Internet</td>
<td>73.9%</td>
</tr>
<tr>
<td>Special Collections digital collections</td>
<td>60.9%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

As seen in the responses, the most used element was the Internet, followed closely by accessing CHALK. This survey was completed before the library integrated LibGuides into course sites on CHALK. A LibGuide is often created for class visits to Special Collections, or a tab is added to an existing guide created by a bibliographer if co-teaching, so an interesting follow-up might be to...
see how faculty evaluate having access to the SCRC-related LibGuides through CHALK.

The third most-used technology element was the Special Collections digital collections, with nearly 61 percent of faculty making use of Special Collections material that has been digitized. Given the amount of staff time that has been devoted to digitizing materials it is gratifying and encouraging to see that classes are making use of these tools. Again, a potential follow-up project could involve determining exactly which SCRC digital collections were being used and to what purpose.

Among presentation methods, PowerPoint continues to dominate, with 74 percent of people using it, compared to only one respondent who reported using Prezi. In the comments section for this question, some people asked what Prezi was, indicating faculty who use our spaces are not moving beyond traditional presentation products. Similarly, very few of our users report incorporating social media into their teaching.

Conclusion
This survey marks a commitment in SCRC to embrace a culture of assessment. The results have provided a greater understanding of the intellectual work that takes place in the SCRC classrooms, and of the interplay between these classrooms as physical spaces with the more abstract processes of student learning. The survey results indicated that use of active learning and hands-on instruction was received positively by faculty and confirmed the continuation of this approach. Public services librarians in SCRC now have baseline, quantified results from which to continue assessing the instruction program.

In addition to quantifiable results regarding instruction, the survey provided impetus for qualitative changes in response to the results. For instance, planning and preparation for classes have been significantly informed by the survey results. Special Collections librarians are encouraging colleagues outside of SCRC to collaborate with creating hands-on instruction when co-teaching a class in Special Collections. The results have also aided in further focusing and defining the SCRC instruction program and allowed for better articulation of its teaching philosophy when meeting with faculty to prepare for a class visit.

While SCRC librarians have promoted student-centered activities that require critical thinking and active engagement with materials, they acknowledge such an approach is more time-intensive than a show-and-tell model. Survey results affirming the value of this labor-intensive teaching practice have thus also aided not only in making decisions about prioritizing staff time, but in providing necessary data to support such prioritization. Similarly, having the information from the survey allows for more focused decision making regarding outreach goals and determining how staff time can best be spent among a range of competing demands for librarians' time. Librarians can target certain types of classes, ranging from ones that would be a good match for SCRC’s collections and teaching approach, to those in areas that have historically not visited SCRC much, yet represent areas for growth.

If anything, the survey has shown that there are a number of ways to be “embedded” in the curriculum for instruction. While instructors indicated they value having a special collections librarian designing exercises that make connections between rare materials and a class’s topic of study, the survey also revealed room for more systematic solicitation of faculty input on acquisitions that could aid their teaching, as opposed to only their personal research. Finally, the information gleaned from the survey regarding instructor’s needs for technology in the classrooms, and the significance of how the spaces are physically arranged, provides valuable data for future decision making regarding equipment purchases. Armed with a new baseline of knowledge about what faculty value in Special Collections instruction, the SCRC librarians have implemented changes to their instruction program, and continue to return to the data to inform decision making in a range of public services offerings. Rather than guessing at what faculty want or students need, public services staff are able to make informed responses to demonstrated needs, and can produce quantified data to support requests that involve both human and financial resources. Bahde and Smedberg note that fear of negative results often holds back assessment in libraries; as this survey shows, however, taking the leap can result in powerful—and positive—results that well outweigh assessment anxiety on the part of librarians. Building stronger partnerships with faculty through special collections instruction, assessment of that instruction, and response to the feedback received shows not just the value of
librarians’ instruction for supporting the teaching and learning missions of their institutions, but also the value of assessment in documenting this impact.

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**Endnotes**


6. Hensley, Merinda, Benjamin Murphy, and Ellen Swain, “Analyzing Archival Intelligence: A Collaboration Between Library Instruction and Archives,” *Communications in Information Literacy* 8, no. 1 (July 2, 2014), [http://www.comminfolit.org/index.php?journal=cil&page=article&op=view&path%5B%5D=v8i1p96](http://www.comminfolit.org/index.php?journal=cil&page=article&op=view&path%5B%5D=v8i1p96).


10. Ibid., 97.
Beyond Downloads: Digital Usage of Scholarly Articles

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Marie Kennedy  
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Through the efforts of Project COUNTER, working with publishers and libraries, measurements for downloads of articles have essentially been standardized. COUNTER-compliant reports are now widely used by publishers and by libraries to monitor how many articles from specific journals are downloaded and to compare download amounts across platforms, titles, and time. Although Project COUNTER reports have given libraries and publishers a proxy by which to measure usage, use and reuse does not stop at the point of download. In fact, measuring only downloads misses repeat and shared usage and underestimates an important aspect of the value of scholarly materials. Articles are shared by forwarding or uploading full-texts, citation/references, or URLs, after or even without downloading.

This secondary type of usage may be reducing the accuracy of existing usage measures, because existing methods cannot and do not capture secondary sharing. For instance, if an article is most often shared in its full-text form, then widespread sharing may lead to a decrease in repeat downloads. On the other hand, if an article is more often shared by a link or citation to the publishers’ version, then an increase in downloads may occur. Both downloading and sharing no doubt varies by stakeholder group (faculty, postgraduate students, undergraduate students, and non-academic researchers) and may differ by other factors.

The Beyond Downloads project examined four essential research questions: What are download counts missing?
1. How much do scholars share and what do they share?
2. How might that be measured?
3. What is a more complete value of articles?

Key findings include:
- A lack of global standards in regard to sharing usage data makes quantifying sharing problematic; hence, a data-based approach to quantifying the extent of post-download sharing of articles may not be viable.
- The great bulk of measurable activity for a typical article takes place on the original publisher’s site; it is a significant challenge for publishers to obtain reliable, consistent data from even the most important and best managed RMSs, which suggests the difficulty in measuring activity across a wide range of such services on an ongoing basis.
- It is difficult to obtain data on authors’ apparent widespread sharing of articles via e-mail and cloud services.
- Due to the variation of methods of sharing articles, data obtained is likely to be out of date rather quickly.
- The lack of global standards for data reporting by RMSs and the enormity of data that would have to be collected, processed and weighed make quantifying sharing a

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Dave Nicholas, Peter Shepherd, Anthony Watkinson, Hazel Woodward

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Tableau is a rapid analytics and data-visualization software that supports library assessment by enabling a library to query, explore, and visualize data in real time. Using Tableau, a library may produce flexible, in-depth, online dashboards, complete with filters and annotations to both customize visualizations and provide context. A library may also blend data from disparate sources to create dynamic, interactive graphics and reports.

As we prepared our panel presentation, we realized that Tableau’s value to academic libraries may best be demonstrated via show-and-tell. We used the following questions to guide our discussion:

- Discuss how your library has incorporated Tableau into its assessment program.
- What impact has Tableau had on your ability to make sense of large data sets, make data accessible, and improve stakeholder communications?
- Where does Tableau fit in your library’s data strategy?

**Tableau at The Ohio State University Libraries**

Tableau is a key tool used by the OSU Libraries assessment program. The software enhances the libraries’ ability to aggregate data and to assemble data from various library systems into meaningful packages for library decision makers. It is a key component of the libraries’ strategy to gather, process, and make data available to both the libraries’ internal and external stakeholders.

I discovered Tableau in spring of 2012, and quickly realized its potential for not only analyzing and visualizing library data, but for gathering, repackaging, and delivering library data in a timely manner to inform decision making. The ultimate goal for incorporating Tableau into the OSU Libraries assessment initiatives is to make data accessible to those who need it—mainly the libraries’ internal and external stakeholders.

**Research Services Trends**

Figure 1 showcases a Research Services Trends dashboard that is updated quarterly for the OSU Libraries Research and Education division’s quarterly report. This dashboard is freely available to all OSU librarians and staff and was created using Tableau’s Desktop Personal software, a production tool which is currently discounted for educators. It was posted to the web via Tableau Public, a free service which allows users to share Tableau visualizations online.¹
The Research Services Trends dashboard presents the libraries’ data for directional, reference, and research consultations in three different ways, allowing staff to visually piece together changes in user behavior over time. The trend line inserted into the line graph on the top left, for instance, reveals that while the number of directional questions asked at the OSU Libraries Columbus campus locations has declined, the number of research consultations provided by OSU librarians has significantly increased. Further, the visualization annotates when the OSU Libraries switched from an in-house mechanism for recording reference transactions to LibAnswers. This change may have influenced some of the drop in directional questions due to some implementation challenges. A text table listing the same data by year is provided on the top right, and a bar chart showing the number of questions by quarter is available underneath. Overall questions spike during the first and fourth calendar quarter of every year, which is not surprising considering the OSU academic calendar.

The three visualizations are linked using a global filter. This allows librarians and staff to highlight Research Consultations in the question type legend and view this data in isolation. This is a particularly useful feature when librarians or staff use dashboards to talk about, or to advocate for, library services with external stakeholders. Librarians and staff may also copy and paste any element of the dashboard into an e-mail or word document.

Tableau Public visualizations may be downloaded to a local PC, making the raw and aggregated data for the visualizations on this dashboard freely available to librarians and staff. Therefore it is
important to disclaim that private, confidential information should not be shared via dashboards uploaded to Tableau Public. The OSU Libraries annually submit reference transactional data to ARL. Thus, the information provided in Figure 1 is publically available through the annual ARL Statistics publication, just not at the level of detail or with the same immediacy provided by the dashboard.²

Tableau offers librarians the ability to blend data from multiple database platforms and software packages. The Research Services Trends dashboard is populated with data from a number of sources, including LibAnswers and previous incarnations of the OSU Libraries’ Ask Database, an internal system the libraries once used to record reference transactional data.

**Gate Count**

A dashboard with the aggregated library gate count, broken down by library location is provided in Figure 3.³ Using this visualization, librarians and staff may adjust the time period displayed, or choose to view only the data for a selected library location.

**Figure 2. Gate Count Dashboard**

![Gate Count Dashboard](image)

Thus, if we select Veterinary Medicine from the Select Library pull-down menu, only data for the Veterinary Medicine Library will display on the screen. The trend line will also recalculate using the data for the Veterinary Medicine Library only.

**ILLIAD Borrowing, 2010—**

In the spring of 2013, the OSU Libraries assembled a five member project team to explore the potential application of Tableau within the OSU Libraries. The Visualizing ILLIAD team was co-led by the assessment coordinator and the head of interlibrary loan and included subject librarians.
from the Research Services and Area Studies departments. Together team members identified questions of interest to subject librarians which might be answered with ILLIAD transactional data, and then built and tested two dashboards to allow subject librarians to interact with and understand borrowing trends for their assigned departments to better inform their collection activities. Questions included:

- Who is borrowing what titles? How often? When? (Who includes patrons and institutions)
- What are faculty affiliated with interdisciplinary centers borrowing?
- Can graduate student borrowing be segmented by academic program?

Figure 3 shows the aggregate number of patron borrowing requests for departments served by one of the OSU Libraries’ science librarians. The map on the top left of the screen shows that OSU primarily borrows materials from its CIC partners for astronomy, chemistry, engineering, and physics students and faculty. The bars in the lower left visually segment borrowing requests by department, year, and month for 2012 and 2013. The Format text table on the lower right is fully interactive. If you click on Book, for example, a full list of titles borrowed during the time period specified is returned, broken down by user department.

Figure 3. Dashboard of ILLIAD Borrowing, 2010–

We quickly realized that this approach failed to provide serviceable data for interdisciplinary areas, such as Jewish Studies. To address this issue, the team constructed a second dashboard using data queried and blended from ILLIAD, Sierra, and a number of other sources, and then filtered the
data using non-English languages. The resulting dashboard in Figure 4 is more useful for our Area Studies librarians, who serve users across a number of academic disciplines. The map on the upper left illustrates that the OSU Libraries borrows non-English materials from a more diverse population of libraries across the nation, while the bubble chart on the lower left highlights that German language materials are requested the most frequently, followed by Spanish, and then French. The text table on the right is fully interactive. Thus, if our Jewish Studies librarian clicks on Hebrew, he will obtain a more robust list of titles requested by patrons during the same time period.

Figure 4. Dashboard of ILLIAD Borrowing, All Languages, 2010--

Tableau at the UMass Amherst Libraries

Tableau is a major component of the assessment program at the UMass Amherst Libraries. The libraries were challenged to make sense of multiple data sources in a variety of formats and needed an increased capacity to visualize, organize, analyze, and share data. Data visualization using business intelligence software (Tableau) was pursued as a strategy when it was determined that a comprehensive data warehouse within the library was not a feasible option.

Visualizations are used by staff to support decision making related to collections, services, and facilities. The ability to integrate and query multiple datasets also supports expectations related to campus goals, accountability, planning, and assessment. The following two examples show a range of visualizations and applications.

Monograph Purchasing, Circulation and Duplication—Micro and Macro Analysis

The ability to build a variety of views from a single rich data set allows for meaningful customization.
Figure 5 displays a sample dashboard which visualizes data from the ALEPH integrated library system. Individual selectors review current and historical data about monograph purchases, including the number of items purchased, expenditures with circulation status, and duplication within consortial collections. Selectors filter the view by fiscal year and the appropriate order group or budget code. Aggregate and individual title level detail is available.

**Figure 5. Dashboard of Purchasing and Circulation (ALEPH)**

Broad collection level analysis is also possible by examining the distribution and use of monographs by Library of Congress classification, school and college allocations, specialized purchasing program performance, or for the collection as a whole (see Figure 6). This data informs conversations and decisions with library staff and campus stakeholders regarding budget allocations and collection development policy.
E-Book Library (EBL) Pilot Project

UMass Amherst participated in a consortial patron-driven acquisition project that offered a wide pool of e-book titles across the Five College Consortium libraries (Amherst College, Hampshire College, Mount Holyoke College, Smith College, and UMass Amherst). Each participating library needed both institution and consortial data to monitor and evaluate use and expenditures. The ability to filter and share data through a web browser eliminated the need for spreadsheets to be repeatedly and individually manipulated. Uniform interaction with the data provided a common framework for discussion (see Figure 7).
As the project progressed, the participating libraries adjusted pilot project parameters related to loan period and price thresholds in response to the significant increases of short-term loan costs from publishers. Expenditures were projected using a range of short term loan trigger scenarios and then graphically displayed. While the horizontal bar-chart visualization at the top of Figure 8 is dense and complex it is easier to understand the relationship between scenarios in comparison to the spreadsheet table below it.
Figure 8. Graphic visualization contrasted with spreadsheet table display

The dashboards displayed in Figures 7 and 8 were central to reaching a shared understanding of the financial implications and consortia decisions related to the pilot project.

Tableau at the University of British Columbia Library

Using Tableau to Explore the Data

Examples from The Ohio State University and UMass Amherst Libraries focused on Tableau as a publishing and data sharing platform. This third section describes Tableau’s potential as a tool for data exploration.

Part of the assessment librarian’s role at the University of British Columbia (UBC) is to make management and user experience data more accessible to those who need it to inform decisions. But providing timely access to data is only part of the picture and means little unless the audience is also engaged with the data presented.

Stephen Few, an expert in the field of visual perception and dashboard design, provides guidelines for data presentation in his book *Information dashboard design: The effective communication of data*. In general a dashboard will be more effective if it is focused on fulfilling a specific data need, and if done well it may also prompt new questions from the audience. These new questions are one measure engagement, but to sustain engagement with the data and reward the audience for asking deeper and potentially more fruitful questions we need tools that can quickly shuffle and re-package the source material to respond to new lines of inquiry.

One of the strengths of Tableau as a data visualization platform is that it makes it relatively easy to aggregate, re-package, and display source data. The sections that follow provide two UBC examples to illustrate this point. The datasets themselves are commonplace but what I hope will spark your own curiosity and sense of possibility is the way Tableau makes it easier to navigate and interpret the data.

Visualizing Circulation Data

The first example is based on loan and discharge data from the UBC Library ILS (see Figure 9). The data was initially pulled to help answer a question about the distribution of the circulation workload across library branches.
This report provides a high-level overview of circulation activity at multiple branches over a single year, with bar charts showing the distribution by hour of day and by month of year for each location. The blue lines represent discharges (items returned), the pink lines represent items being checked out, and the bars are the sum of the two. The height of the bars represents the percentage of the annual total in any given month or hour, and by stacking graphs for different branches it is possible to compare workload distribution patterns from one location to another at a glance.
Figure 10. UBC Library Circulation: % of Activity by Month and Library Branch

Note in particular the four summer months displayed in Figure 10: there is less activity from May through August at all locations except the BMB branch. With Tableau it is possible to quickly view this level of detail for all branches, helping managers make informed decisions about resource allocation across multiple locations.

Another way of viewing the same dataset is by the percentage of daily work distributed across the hours of the day (Figure 11).

Figure 11. UBC Library Circulation: % of Daily Activity by Hour and Library Branch

Both of the David Lam and Woodward locations are open until 10 p.m. but only a small percentage of daily activity falls within the service hours of 6 and 10 p.m. Notice how sharply the bars drop after 6 p.m. at the Woodward library branch. Now compare this to the slightly less acute post-6 p.m. shift at the David Lam branch. Those four hours account for only 10% of the daily circulation activity.
at Woodward but 16% at the David Lam branch. All else being equal David Lam circulation staff maintain a higher activity level between 6 and 10 p.m., but do these graphs help us understand why?

Because the graphs also show detail about charges and discharges—the blue and pink lines—the figure also points to a possible explanation. Notice in the graph at the top how the blue curve representing discharges is shifted to the right, or later in the day. This suggests that David Lam library staff do more of their daily discharge work in the slower evening period, potentially helping daytime staff remain available to users who visit the desk for in-person help. We cannot know from this data whether other factors account for the difference but the graphs support a hypothesis that merits further exploration and may help branches establish and share best practices.

Figure 12. Visual representation of LibQUAL+ results for a sample question

UBC results for the 2013 LibQUAL+ survey identified information control as the dimension where the most improvement was needed to meet respondent expectations. But the information control dimension covers a wide range of activities and more detail is required to determine where in particular the library should focus its improvement efforts. Because the visualization is based on raw data rather than aggregated scores, Tableau makes it easy to drill further down and view scores for individual questions in this group simply by adding new dimensions to the display.

Visualizing results of the LibQUAL+® Survey
The second example from UBC relies on a dataset that is familiar to many North American academic libraries: the LibQUAL+ survey. This is a rich dataset, particularly when longitudinal data is available. In practice, however, the potential for examining change over time was not realized at UBC because summary data was often presented in formats that made comparisons time consuming.

One of UBC Library’s first experiments with Tableau was to reformat the raw data from three years’ worth of LibQUAL+ surveys. The resulting online report enables longitudinal comparison and makes it easier for library staff to view responses by user group and by LibQUAL+ question (Figure 12). A vertical orange band is used to represent the range between the average minimum and desired service levels, and a blue dot or line represents UBC Library’s perceived service level for a given question.
Figure 13. 2013 UBC LibQUAL+ results: information control questions

Figure 13 displays the results for faculty respondents in the top row and the results for UBC student in the bottom row. Questions are arranged from left to right by the average perceived service level, represented by the blue dots. When identifying priorities for improvement the areas where expectations are high and where perceived service level is near or below the minimum are usually the most important (these tend to be the questions displayed on the left).

In this case, however, I would like to highlight the question on the far right: in 2013 UBC respondents’ expectations were lowest when it came to “the printed library materials I need for my work.” Because the Tableau visualization is linked to longitudinal data it is possible to view how responses vary over time and by academic discipline—variations that may be particularly relevant as libraries shift from print to electronic monographs.

Figure 14. Longitudinal UBC LibQUAL+ Results (N refers to 2013 survey)
For Figure 14 each orange band within a column represents a LibQUAL+ year: 2007 on the left, then 2010, and 2013 on the right. The downward stepping trend in each of the four schools (sometimes referred to as faculties) tells a story about changing expectations. For each group the acceptable service range has decreased steadily since the 2007 survey but there are differences in the pace of this change: respondents who identified themselves with humanities and social sciences are following the trend exhibited in the sciences with some lag time.

None of the LibQUAL+ visualizations presented here are based on data that is new to UBC Library, but Tableau helped to breathe new life into relatively commonplace data sets, making them more relevant to certain audiences. The result: as assessment librarian I can genuinely welcome requests to slice the data in different ways, supporting creative new applications for library datasets and, hopefully, a renewed sense of the potential in our existing data.

Notes


Abstract
After determining that current assessment techniques were no longer yielding data of practical value, the Research Services Unit at the University of Nebraska Omaha Criss Library changed both their teaching and assessment models for Composition II library sessions. The unit adopted a partially flipped model by combining out-of-class tutorials with in-class active learning exercises. Rather than conduct the multiple choice assessments used in the past, the team worked with Comp II instructors to adapt a rubric for use in analyzing a representative sample of student papers. While many libraries are using rubrics to assess various aspects of information literacy instruction, not many have a strong collaboration with instructors when developing assessment tools. This paper focuses on the collaborative effort of librarians and instructors to adopt new modes of instruction, learning, and assessment. Discussed is the history of the instruction program outlining the need for change, the planning process, the development and refinement of the rubric, and the use of formative assessment as part of the flipped class model.

Implementation
First, RSU staff created a list of learning goals for students in Comp II, aligning the list with both Association of College and Research Libraries (ACRL) and University of Nebraska Omaha (UNO) student learning outcomes (SLOs). Then the RSU Comp II coordinator created a template outline for Comp II sessions, focusing each session on two or three SLOs. Next, tutorials were developed focusing on practical paper writing skills including: deconstructing the research question, finding information to support a thesis statement, evaluating information, and synthesizing the information into an argument. Finally, RSU staff worked together to create an active learning activity bank containing in-class exercises designed to teach information literacy SLOs and to reinforce the concepts covered in the tutorials.

Moving away from a lecture and demonstration model to one with in-class active learning created anxiety, as long-term staff members were unsure of their ability to teach the exercises successfully. To alleviate concerns staff members attended classes in which librarians were implementing active learning exercises. Having a class outline template...
and an activity bank helped as well. Weekly RSU staff meetings became a space to share new ideas, discuss activities that worked or did not, and address concerns.

For the initial pilot the coordinator met with English department instructors at their annual fall meeting. A signup sheet went around for volunteers for the flipped model. Approximately one-third of the instructors volunteered. There was no formal assessment undertaken with the Comp II instructors, but anecdotally there was evidence that the instructors were pleased with the model. After the first semester of the pilot year, Comp II instructors who had not initially volunteered for the flipped model inquired about it and/or about including active learning exercises for the next semester.

Formal Assessment
Prior assessments for the Comp II library instruction program entailed pre- and post-tests delivered through Blackboard. The results demonstrated that students improved on test questions regarding various information literacy (IL) skills after receiving IL instruction. However, with this type of assessment it is difficult, if not impossible, to tell if the students were mastering the university’s target SLO for Comp II: to locate, evaluate, and integrate information into a well-developed argument with proper citations. In addition, RSU staff were interested in a more authentic summative assessment tool, one that would give data not only on student performance, but would also help staff improve teaching methods and be adaptable to ACRL’s forthcoming Framework for Information Literacy.

The RSU Comp II coordinator determined that a rubric used to assess student ability to access, evaluate, synthesize, and cite information would be the most authentic assessment tool in delivering the best value for improving instruction. In current library literature, there are many case studies of librarians using rubrics as authentic assessment; rubrics are proving to be strong components of library instruction assessment programs. To create the rubric, the coordinator looked for sample rubrics in the library literature. Of the rubrics found, the one most suited to evaluate local Comp II students’ output was one developed by Oakleaf, Millet, and Kraus to assess student information literacy skills. Even prior to being adapted this rubric closely dovetailed with UNO and library SLOs. An assessment team of two RSU staff and two Comp II instructors (later this team become three RSU staff, two librarians, and one paraprofessional, along with the original Comp II instructors) met to adapt the sample rubric to create the first version.

Along with their strengths for authentic assessment, rubrics also present some challenges. One study notes the discrepancies amongst groups of raters and the difficulty in creating an assessment tool that can fit multiple variations of a literature review assignment. Other studies ended up with unexpected results and could not discern whether this was a problem with the assignment, the rubric, or the raters.

There are strategies, however, to combat these challenges. One crucial strategy is rubric norming, the process of standardizing the raters’ assessments. To norm and refine the rubric the RSU staff on the assessment team followed processes outlined by Holmes and Oakleaf. In total the team received 26 student papers, a small sample, but ultimately enough for refining and norming the rubric. RSU team members assessed the student papers in sets of 5–6, using a Google form to input scores. The first version of the Google form did not allow for comments, but after the first norming session a comment box was added so that raters could enter their reasoning for their scoring choices. After each set of papers was rated the team met to discuss the results, address any discrepancies, and refine the rubric. In all the rubric went through six iterations before the team was satisfied (see Appendix A for version 1 and Appendix B for version 6).

In addition to standardizing the raters’ assessments, rubric norming can be an important part of meaningful assessment in its own right. As part of the rubric creation and refinement process RSU staff discussed student learning outcomes in further detail and were able to gain a better understanding of which information literacy concepts RSU instructors should be focusing on in the Comp II sessions. Whereas in previous classes the main focus was on accessing and evaluating information, the committee realized that students needed more meaningful instruction on evaluating, plus guidance on synthesizing and citing. This led to further discussion with the Comp II instructors,
as the team debated ways in which instructors and librarians could address these knowledge gaps in the library sessions. Ultimately RSU team members were able to use the rubric to address Comp II instructors’ expectations for the library sessions and align those expectations with RSU’s strategy for student learning.8

Informal Assessment
In recent years more library literature is being published advising librarians on the use of informal or classroom assessment techniques.9 Along with formal assessment, this informal or classroom assessment is crucial for a successful flipped model. Library instructors must have an immediate way to tell if a class activity is succeeding or not. Formative assessment is one particular form of informal/classroom assessment that, while not always easy to implement, can be extremely eye-opening regarding the skills students develop in one-shot sessions.10 However, the librarian must act on the results during class in order to drive student learning.11 For example, in an activity designed to teach students that topic development is a component of the research process, students are given a worksheet for brainstorming keywords. Once they have a short list, students then enter those keywords into an assigned database. The listed results should provide additional keywords through subject headings, article titles, and abstracts. The students add those keywords to the worksheet and repeat the search with the new keywords. While students work, the librarian walks around and checks each individual’s progress. As they struggle, the librarian can offer assistance. The librarian can determine where more instruction is needed, and the students benefit from the immediate feedback.

It is not easy to create active learning activities that: (1) draw on the information presented in the tutorials; (2) are still feasible for students who did not watch the tutorials; and (3) include formative assessment. However, the activities that allow for all three are richer and more rewarding for both student and librarian.

Next Steps
With the rubric in its final version and the pilot year complete, the committee can present the next round of results to campus stakeholders. For future years, Comp II instructors will no longer be asked to volunteer for the flipped model. Rather, all Comp II instructors receive links to the tutorials via e-mail and are asked to indicate whether or not they will be assigning the tutorials upon receiving the links. Because some instructors are opting out of the flipped model the committee should be able to compare assessment results among the flipped and non-flipped models. As the program continues the active learning bank will grow, formative assessment will be more fully integrated into the Comp II library sessions, and RSU staff will further work to collaborate with Comp II instructors. Final results of the assessment project will be published in a future study.

—Copyright 2015 Katie Bishop

Endnotes


doi:10.1108/00907320610640752; See also the RAILS project at http://railsontrack.info/.


11. Ibid., 46.
### Appendix A (Rubric Version 1)

<table>
<thead>
<tr>
<th>ACCESS</th>
<th>BEGINNING</th>
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<tr>
<td>Sources do not go beyond basic knowledge</td>
<td>Some sources provide in-depth exploration of topic</td>
<td>Most or all sources provide in-depth exploration of topic</td>
<td>Uses academic sources</td>
</tr>
<tr>
<td>Few or no academic sources (if required)</td>
<td>Some academic sources</td>
<td>Uses academic sources</td>
<td>Obvious consultation of experts</td>
</tr>
<tr>
<td>No consultation of experts</td>
<td>May demonstrate consultation of experts</td>
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<td>Uses sources incorrectly or superficially</td>
<td>Demonstrates some understanding of source integration</td>
<td>Fully integrates sources into argument</td>
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<tr>
<td>Uses sources not relevant to the topic</td>
<td>Uses some sources not relevant to the topic</td>
<td>All sources relevant to topic</td>
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<tr>
<td>Confuses primary, secondary, and tertiary</td>
<td>May confuse primary, secondary, tertiary sources</td>
<td>Understands the difference among a variety of sources—primary, secondary, tertiary sources</td>
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<table>
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<th>BEGINNING</th>
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<tbody>
<tr>
<td>Uses no credible or authoritative sources</td>
<td>Uses mix of credible and questionable sources</td>
<td>Uses only credible and authoritative sources</td>
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</tr>
<tr>
<td>Uses only popular sources</td>
<td>Uses a disproportionate amount of popular sources</td>
<td>Distinguishes popular and academic sources</td>
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</tr>
<tr>
<td>Uses outdated information</td>
<td>Uses a mix of current and outdated information</td>
<td>Uses the most current information</td>
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</tr>
<tr>
<td>Fails to recognize bias</td>
<td>Partially recognizes and/or deals with bias</td>
<td>Fully recognizes and deals with bias</td>
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<table>
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<th>CITATION</th>
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<th>EXEMPLARY</th>
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<tr>
<td>Fails to properly identify and cite all sources according to the standards of ethical and fair use of intellectual property</td>
<td>Properly identifies and cites all sources according to the standards of ethical and fair use—may be minor mistakes in formatting</td>
<td>Properly identifies and cites all sources according to the standards of ethical and fair use of intellectual property with no noticeable mistakes</td>
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<td>Does not include a complete bibliography</td>
<td>Includes a complete bibliography which may contain formatting errors</td>
<td>Includes a complete bibliography</td>
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<tr>
<td>Uses source material as indirect quote without adequate paraphrasing</td>
<td>Attempts to paraphrase or summarize cited material but poorly worded/rephrased</td>
<td>Uses proper format for the subject area</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Effectively paraphrases or summarizes ideas/information from the cited source materials using original language</td>
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<th>DEVELOPING</th>
<th>EXEMPLARY</th>
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<td>Does not consider a range of sources and perspectives</td>
<td>Demonstrates some range with sources and perspectives</td>
<td>Considers a variety of sources and perspectives</td>
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</tr>
<tr>
<td>Demonstrates little or no synthesis of arguments/ideas: unable to integrate sources with each other or with one’s own argument</td>
<td>Demonstrates some critical engagement with sources tending toward summary, rather than higher-level synthesis</td>
<td>Demonstrates sophisticated level of engagement with sources</td>
<td></td>
</tr>
<tr>
<td>Misrepresents other positions on the topic, or fails to identify or acknowledge other views</td>
<td>Represents some other positions, with varying degrees of accuracy—may fail to acknowledge some major perspectives</td>
<td>Accurately represents major/leading positions on the topic</td>
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## Appendix B (Rubric Version 6)

<table>
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<td>• Sources do not go beyond basic knowledge</td>
<td>• Some sources provide in-depth exploration of topic</td>
<td>• Most or all sources provide in-depth exploration of topic</td>
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</tr>
<tr>
<td>• Few or no academic sources (if required)</td>
<td>• Some academic sources</td>
<td>• Uses academic sources</td>
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<tr>
<td>• No consultation of experts</td>
<td>• May demonstrate consultation of experts</td>
<td>• Obvious consultation of experts</td>
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<td>• Uses no credible or authoritative sources</td>
<td>• Uses a mix of credible and questionable sources</td>
<td>• Uses only credible and authoritative sources</td>
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<tr>
<td>• Uses only popular sources</td>
<td>• Uses a disproportionate amount of popular sources</td>
<td>• Distinguishes popular and academic sources</td>
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</tr>
<tr>
<td>• Uses outdated information</td>
<td>• Uses a mix of current and outdated information</td>
<td>• Uses the most current information</td>
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</tr>
<tr>
<td>• Uses sources not relevant to the topic</td>
<td>• Uses some sources not relevant to the topic</td>
<td>• All sources relevant to topic</td>
<td></td>
</tr>
<tr>
<td>• Fails to recognize bias</td>
<td>• Partially recognizes and/or deals with bias</td>
<td>• Fully recognizes and deals with bias</td>
<td></td>
</tr>
<tr>
<td>• Does not consider a range of sources and perspectives</td>
<td>• Demonstrates some range with sources and perspectives</td>
<td>• Considers a variety of sources and perspectives</td>
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<td>• Demonstrates little or no synthesis of arguments/ideas: unable to integrate sources with each other or with one’s own argument</td>
<td>• Demonstrates some critical engagement with sources tending toward summary, rather than higher-level synthesis</td>
<td>• Demonstrates sophisticated level of engagement with sources</td>
<td></td>
</tr>
<tr>
<td>• Misrepresents other positions on the topic, or fails to identify or acknowledge other views</td>
<td>• Represents some other positions, with varying degrees of accuracy—may fail to acknowledge some major perspectives</td>
<td>• Accurately represents major/leading positions on the topic</td>
<td></td>
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<tr>
<td>• Uses sources incorrectly or superficially</td>
<td>• Demonstrates some understanding of source integration</td>
<td>• Fully integrates sources into argument</td>
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<tr>
<td>• Fails to recognize need for supporting evidence for all claims</td>
<td>• Some claims need more supporting evidence</td>
<td>• All claims fully supported by evidence</td>
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<table>
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<th>CITING</th>
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<tr>
<td>• Fails to properly identify and cite all sources according to the standards of ethical and fair use of intellectual property</td>
<td>• Properly identifies and cites all sources according to the standards of ethical and fair use—may be minor mistakes in formatting</td>
<td>• Properly identifies and cites all sources according to the standards of ethical and fair use of intellectual property</td>
<td></td>
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<tr>
<td>• Uses source material without proper in-text citations</td>
<td>• Attempts to paraphrase or summarize cited material but poorly worded/rephrased</td>
<td>• All supporting evidence fully attributed to source material</td>
<td></td>
</tr>
<tr>
<td>• Uses source material as indirect quote without adequate paraphrasing</td>
<td></td>
<td>• Effectively paraphrases or summarizes ideas/information from the cited source materials using original language</td>
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Puzzle Pieces: Assessing Student Work Using Rubrics and Citation Analysis for Dual-Purpose Assessment

Alan Carbery
Champlain College, USA

Abstract
This lightning presentation describes a two-pronged assessment project using a sample of authentic student work completed as part of general education coursework requirements. Using an information literacy rubric, and specially designed citation analysis checklist, librarians assessed a number of first-year annotated bibliographies. Insight from the assessment project has given librarians greater insight into the information seeking behaviors of students engaged in course research. This data has also allowed librarians to adapt and tailor instruction accordingly.

Introduction
This lightning presentation briefly describes the findings of a two-pronged assessment project undertaken in the Champlain College library. Sampling authentic student coursework, two librarians assessed the artifacts for evidence of information literacy using a specially designed rubric. Following this, a deep citation analysis was carried out on each citation within the artifacts to discover the information seeking habits of students and determine to what extent students made use of library collections when undertaking a course-required research project. This presentation also briefly describes the changes made to instruction as a result of the assessment project.

Authentic assessment
While assessment of student performance in the area of information literacy has guided many practitioners, many turn to standardized or indirect assessment measures. This paper describes the use of direct, authentic assessment where librarians sampled student research artifacts completed as part of course requirements within their academic study. Undergraduate students at Champlain College complete a common core liberal arts curriculum as part of a cohort. This ensures that all traditional undergraduate students have a common general education experience alongside the curriculum from their professional programs. This has also allowed librarians to embed a scaffolded, course-integrated information literacy program throughout the first three years of the common core experience. By sampling authentic student work from the core curriculum, Champlain College librarians are able to build assessment data that represents the entire undergraduate student population, while also directly assessing performance courses that have information literacy instruction embedded. By using authentic assessment, librarians are also able to assess student performance in a “real-world” context—understanding how students’ competencies affect their performance in their actual coursework. Assessment is truly embedded with an authentic assessment model. Finally, authentic assessment allows instruction librarians to adapt their pedagogical approaches to address specific student needs.

Two-pronged Assessment
As part of a cohorted first year 100-level course, all students are required to complete an annotated bibliography based on a particular community as part of a common assignment. This presentation describes the assessment of a sample of annotated bibliographies for performance against the college’s information literacy competency. In total, approximately 12% of all first year annotated bibliographies were randomly sourced and assessed using a previously designed rubric. This rubric assessed students from a number of criteria: thesis scope, completeness of annotation, variety of sources used, quality of citations, and holistic impression. Each criterion was assessed using a four-point rubric scale.

Additionally, after the rubric assessment of student work, two librarians (the author of this presentation, and Champlain College’s scholarly resource and academic outreach librarian) conducted a deep citation analysis of each citation
from students’ annotated bibliographies. Using a specially designed citation analysis checklist, we analyzed citations in an effort to determine the level of collection usage by students while undertaking course-required research, and to determine information seeking patterns and behaviors of students.

Findings
Overall student scores from the rubric assessment were somewhat distributed from a score of 1.2 (at the lower end), towards a score of 3.8 (at the higher end) (see Figure 1). However, the biggest distribution of students obtained a score of 2.4 overall. Combined, a large number of students obtained a score between 2.6 and 3.0. This finding is probably in line with where we might expect a first year student to perform early in their information literacy development. This has established an acceptable baseline from which our students are performing early in their undergraduate studies, with the hope that their performance will improve as they proceed in their undergraduate studies, and as they receive further course-integrated information literacy instruction.

When looking closely at the specific criteria that were assessed, in tandem with the data from the citation analysis, an interesting picture emerges.

Variety of Sources
Overall, students tend to choose an acceptable variety of sources, including scholarly, peer-reviewed materials for course assignments. Unsurprisingly, students gravitate towards online and electronic source types—not just for journals and websites. Students made heavy use of e-books available from either library subscriptions or from the open web (such as Google Books).

Primary Sources
The annotated bibliography is designed to encourage (but not require) students to source and use primary source material. This assessment project has clearly illustrated that many students found the term “primary sources” to be confusing. Often mistaking the term to mean “my main source,” students were not entirely successful in their understanding of traditional, historical primary sources as used in the humanities.

Research Topic Selection
When given the opportunity, students often tend to choose research topics derived from popular culture, instead of traditional, scholarly, and/or historical contexts. For example, a number of students chose to complete their annotated bibliography on the Brony Community (a predominately online community, typically comprised of adult males who identify as fans and followers of the My Little Pony franchise). However, when students choose less-scholarly research topics, they appear more likely to omit scholarly, academic source types in their annotated bibliographies. Students seem to have difficulty tying a popular, current research topic to scholarly, theoretical sources.

Using Information
When looking closely at the annotations students write, it appears that students have less trouble sourcing materials and need greater help with synthesizing and using information. When discussing critical aspects of sources, students tend to over rely on authority for a critical evaluative point of view. Indeed, this overreliance also extends to a rudimentary concept of authority. Students often made broad, over generalized critical statements that equate a good source to the author having doctorate qualifications. Students appeared to have difficulty expressing authority, bias, point of view, or any other critically evaluative aspect beyond this basic idea of authority. For many, writing the annotation appears to be the most difficult component of the annotated bibliography, as opposed to sourcing quality, scholarly sources.

Citation Management Tools
While students did tend to perform well with the citation criterion, there was a visible pattern of students omitting important citation details such as pagination, dates, etc. As librarians conducted the citation analysis, we found that these details were indeed easily retrievable. This omission by students has caused us to surmise that students have come to rely heavily on citation management tools while completing their annotated bibliographies. While analyzing the citations, and comparing them against library holdings, students appeared to often annotate a citation as a print resource, when indeed the library’s collection holds the item in e-book format only. Students appear to sometimes pass e-format items as print format items in their citations. This might be due to a trend with some
faculty to insist their students source printed books for their research.

**Realigning Instruction**
This assessment effort has provided great insight into the information behaviors of students when undertaking scholarly, course-required research. Also, the rubric-based assessment has also highlighted some areas for student development that have given us the opportunity to align instruction to best address these needs. For future 100-level annotated bibliography information literacy instruction sessions, librarians have redesigned instruction to focus on synthesizing and using information, instead of relying heavily on helping students find information. Indeed, librarians have begun using the “scholarship is a conversation threshold” concept as a frame to engage students in a conversation that will guide them when completing annotations for their annotated bibliographies.

Also of concern to librarians was our finding that students misunderstood the primary source type. In an effort to close the assessment loop, librarians were given the opportunity to design a new 200-level information literacy lesson that would look specifically at finding and using primary and historical source types.

**Conclusion**
Undertaking the two-pronged assessment effort described in this presentation has been an important one for us. Librarians have taken ownership of assessing authentic course-required student work for evidence of information literacy. This has started a trend that we hope to develop and continue year-by-year, and into other courses. By standardizing the rubric, this will allow us to build an assessment development plan that will chart the progress of students in information literacy over the long-term. This is currently in the works at Champlain College.

The citation analysis aspect of the two-pronged assessment provided us with great insight into students’ use of library collections for the purposes of academic research. This information has been useful, not just from an instructional outreach perspective, but also from a collections development perspective. This will inform other aspects of library services going forward. While this citation analysis has provided us with valuable insight, it is a time consuming endeavor. We do not expect to repeat this citation analysis on a yearly basis, opting instead for a more cyclical approach. Regardless of this, sourcing authentic student coursework artifacts for assessment purposes has been an important undertaking for Champlain College Library.

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**Endnotes**
Turn a Disaster into a Research Opportunity: Assessing One-Hour Library Sessions after Hurricane Sandy

Hong Cheng
LaGuardia Community College, City University of New York, USA

Abstract
Assessing a library’s one-hour sessions is a key objective in many academic libraries. Moreover, it requires librarians to examine the effectiveness of teaching in a systematic and longitudinal approach in order to produce a holistic picture of the students’ learning experience. This article focuses on a unique assessment opportunity that emerged in LaGuardia Community College, City University of New York. Librarians were able to reach 488 students using a pre- and post-session survey after Hurricane Sandy caused a week of class cancelations. 16 canceled sessions were matched and compared with another 16 randomly selected sessions that had library instruction. The resulting data indicated that students who attended a library session performed significantly better than students who did not on tested outcomes. This project was also evaluated as a benchmark and librarians continued on the assessment journey in the following semesters.

Introduction
Assessing a library’s one-hour sessions, or, widely recognized as one-shots, is a universal challenge. There is a large number of examples in the literature exploring the best practices in assessing how well students have learned and how librarians can use the data to assess their effectiveness and close the loop. Librarians at LaGuardia Community College (LAGCC), City University of New York faced the same situation but were determined to tackle the difficulty as it was also included in that year’s strategic plan. The project started in the fall of 2012 and continued and flourished after that. We focused on using the pre- and post-session surveys aiming to depict the trajectory of students’ tested information literacy (IL) skills.

A Brief Review of IL Assessment
Though teaching IL is viewed as a shared mission in many institutions, libraries perceive themselves to be playing an essential role in assessing it at the program as well as institutional levels. Fundamentally, as Peggy Maki argues, “student development, at both the undergraduate and graduate student levels, is the collective responsibility of all educators in our higher-education institutions.” A very common model of partnership is for librarians to offer one-hour mandatory or voluntary sessions to other departments, based on students’ information and research needs. Assessment efforts, according to the ACRL Assessment Issues, can be placed within four levels: within the library, in the classroom, campus wide, and beyond the campus. The library literature is never short of research or reports on assessment at those levels of which in-class assessment activities are frequently discussed such as web-based tests and surveys. It is also commonly seen in conferences that librarians “measure any improvement through a survey of students (self-reporting their perceptions) or completion of some type of test that measures the extent to which student skills and abilities improved during the course.” Ultimately, the goal of assessment is to “plan, document, relate, and improve.”

Many libraries have adopted a variety of methods in assessing the teaching effectiveness of one-hour sessions. Traditional popular tools such as tests and outcome based surveys touch on a list of clear learning outcomes that will be taught during the instruction. From the assessment standpoint, learning outcomes should be student-focused, task-oriented with actions, and measurable. A good example is that librarians and English faculty from Dakota State University worked on a collaborative IL assessment project by using pre and post tests. They focused on open ended questions that are intended to provide students “fantasized scenarios for assessment purposes.” Rubric-based “authentic performance assessments (e.g. portfolios, research papers, annotated bibliographies, and work-sheets)” have gradually become another major instrument in assessing students’ overall
level of IL.8 This time consuming yet powerful tool is frequently used at the course level, such as examining students’ portfolios,9 or can be at the institutional level.10 Other instruments such as using a standardized test (iSkills, SAILS, or others), observation, and focus groups are also talked about a lot in the literature, and they are equally important as the instruments mentioned above in leveraging assessment to a higher and larger level: to “the demonstration and articulation of the impact of libraries on institutions of higher education”.11

Background
ENG101 and ENG103 classes at LAGCC include a mandatory library session, which usually lasts for an hour. Students come to the library to learn the basic research skills that are appropriate at the college level. The way the library instruction schedule is finalized is based on the registration information one week before the semester starts: the library sends out a master calendar with each class assigned to a specific date, but English instructors are allowed to change the date if needed. So statistically, all ENG101 and 103 sessions are scheduled in a random scheme and the only factor for scheduling is the weekly time each class takes place.

The number of one-hour library sessions at LAGCC has grown extremely fast in the past seven to eight years. Likewise, the library also requires each full time librarian to take a share of the teaching load, in addition to his or her main responsibilities. Historically, the library has adopted multiple assessment tools such as SAILS (2008) and iSkills (2009) to test IL as a basic skill. On the other hand, using a rubric on assessing one component of the ACRL Information Literacy Standards for Higher Education took place in 2010 but had to stop due to a personnel change. Driven to offer some insights about students’ IL to the campus administration, the library was compelled to shift the attention to one-shots. More importantly, the library administration was looking for a structure in which librarians were able to track students’ progress through a sustainable and longitudinal mechanism.

Hurricane Sandy Project
On October 29, 2012, Hurricane Sandy hit New York City and its surrounding areas and caused a week of class cancelation at LAGCC. Unfortunately, 18 pre-scheduled ENG101 library instruction sessions were canceled and not able to be rescheduled due to an already full calendar. Though instructors were encouraged to teach the library research by themselves, only two responded to this request. Thus the rest of the 16 sessions became a natural comparison sample from a research perspective. Considering that finals week was approaching, the library reacted instantly: creating an ad-hoc instruction assessment committee, randomly selected another 16 ENG101 classes which had a library session using a matching method, developed a paper-based survey which was successfully approved by the campus IRB committee, and surveyed students from both groups.

The committee adopted the pre- and post-session survey as the main instrument based on the following reasons:
1. For students who had an instruction session not long before the disaster, memories about what they had learned remained relatively fresh compared to students who had had a session over a month ago. Although it is not accurately measurable how much knowledge is still retained, a large sample size would help reduce the noise factor. This is also a hotly-debated topic as for when the perfect timing for assessment would be. As for us, the pre and post-session survey stood out given the unexpected timing.
2. Many English instructors of canceled classes were hesitant to give the library more assessment time since the hurricane had already caused a week of cancelation. If librarians waited longer, it would be technically difficult to track the sample students as there is a high rate of student turnover at LAGCC.
3. There were estimates that more than 300 students were excluded from library sessions due to the disaster, so surveying became the most practical tool to reach out to such a large population.
4. The cost of conducting surveys and personnel is relatively low compared with other instruments.

The survey was composed of six questions and was intended to test three learning outcomes, as committee members estimated most sessions had integrated all of them: students are able to:
• develop appropriate keywords and utilize Boolean operators in searching;
• identify scholarly articles and locate databases via the library website; and
• identify books and locate the catalog via the library website.

Results
Figure 1 reports the mean number of correct replies. The overall number of participants is 488 with 255 from the post-survey group and 233 from the pre-survey group. The maximum number of correct answers is five. Students who attended the instruction session scored higher in the survey than students who did not attend the library’s instruction: 3.36 vs. 2.95. The differences observed were statistically significant.

<table>
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<th>Figure 1: Fall 2012 Library One-Hour Session Survey</th>
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<td>Number</td>
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<td>Mean correct replies (Std. Dev.)</td>
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</tbody>
</table>

Source: The Effectiveness of Library Instruction in ENG 101 on Students’ Ability to Use Library Resources for Research Purposes (A natural experiment) Fall 2012

Students who attended a library instruction session selected the appropriate keywords and operators for the search 42% of the time, versus 24% for students who did not have library instruction. Students in both groups struggled with Boolean operators, which are important for searching through many of the library’s subscription databases. Students who attended a library session did not differ significantly from students who missed instruction in understanding the navigation of the library website. However, students who attended a library instruction session were more likely to identify an item as a book or an article based on a screenshot.

<table>
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<tr>
<th>Figure 2: Fall 2012 Pre- and Post-Session Survey Results</th>
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<td>Correct Responses, Q2 (Determine keywords)</td>
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<td>Correct Responses, Q3 (Determine sources)</td>
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<td>Correct Responses, Q4 (Website link)</td>
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<td>Correct Responses, Q5 (Determine sources)</td>
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<td>Correct Responses, Q6 (Website link)</td>
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</table>

Source: The Effectiveness of Library Instruction in ENG 101 on Students’ Ability to Use Library Resources for Research Purposes (A natural experiment) Fall 2012

Findings and Discussion
The results above demonstrated statistical significance that students who attended the library session demonstrated a higher ability in tested basic research skills, and recognized items presented from a search. On the other hand, both groups faced challenges in identifying keywords and using Boolean operators in the best-fit context. Post survey classes showed higher scores in identifying a database article and the best
website link, though failed to show higher scores in identifying a catalog record. The implications are self-evident: anecdotally, librarians teach students to use a subscription database more than the catalog and these two resources are located in two different entries on the library homepage. That is why both groups showed a lower rate in recognizing a catalog screen shot. The reason the post survey group did slightly poorly than the pre group was not easy to identify, but it could be the post group students were confused about these two resources and thought both sources were from a subscription database. This question failed to differentiate the skills of the two groups so it would not be recommended to use in the future. What needs to be pointed out is the question pertaining to determining keywords and Boolean operators, for which both groups showed a low correct response rate, with the post group doing better than the pre group. There are two possible reasons associated with it: first of all, since this learning outcome was not required by each teaching librarian, there would have been students who took a library session and learned to use effective strategies, while other students were not taught at all. Second, compared with the question of recognizing different library resources, selecting the appropriate keywords and Boolean operators is a more complex task, thus the question really tested whether students could use advanced strategies to yield more relevant results. The takeaway is that even though this question worked well from the assessment perspective, librarians should make sure students learn these skills in order to show improvement in the future.

Benchmarking and Continued Assessment Projects
After the unplanned project in the fall of 2012, the committee decided to continue the assessment as the library will document successive data on students in the same learning outcomes. So starting in the spring of 2013, the committee started to work on standardizing the learning outcomes for all librarians. There were never stated and unified learning outcomes for all sessions, and it was also not possible to do so since classes are highly customized. Committee members narrowed down the basic outcomes that the majority of librarians agreed to include in a survey and finalized the following two learning outcomes: students are able to demonstrate awareness of library databases; students are able to identify appropriate keywords and use Boolean operators to construct searches. The survey was sent out to 40 randomly selected classes with 20 pre and 20 post survey classes in the spring of 2013 and the fall and spring of 2014. See appendix B for the updated survey.

<table>
<thead>
<tr>
<th>Group</th>
<th>Q4 Determining a reliable source (%)</th>
<th>Q5 Use keywords and Boolean operators to yield relevant results (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 13 Pre</td>
<td>12.3</td>
<td>15.8</td>
</tr>
<tr>
<td>Spring 13 Post</td>
<td>34.3</td>
<td>44.4</td>
</tr>
<tr>
<td>Fall 13 Pre</td>
<td>14.7</td>
<td>32.1</td>
</tr>
<tr>
<td>Fall 13 Post</td>
<td>39.5</td>
<td>43.4</td>
</tr>
<tr>
<td>Spring 14 Pre</td>
<td>18</td>
<td>14.7</td>
</tr>
<tr>
<td>Spring 14 Post</td>
<td>52.2</td>
<td>48.7</td>
</tr>
</tbody>
</table>

Source: Spring 2013 to Spring 2014 ENG101 Library Survey Core Data

The three semesters' results indicate a really positive trend. According to the latest Library Instruction Survey 2014 Spring Report:

Along with previous term’s findings, the general trend suggests that students who attended library instruction were more likely to improve the ability in using library resources and applying search strategies in research. The differences between the student groups were significant. The results also demonstrate that the ability of the library's instruction team to provide students with the appropriate guidance to use its resources has been increasing, and the instruction regarding identifying keywords and using Boolean operators in
research has been contributing to increased positive outcomes in this area.\textsuperscript{33}

At the time this article is being written, the committee started a new round of surveys, including a similar survey for First Year Seminar library classes, a new instruction component for the library.

Summary
As the initial assessment project on the library's one-hour sessions, the Hurricane Sandy project served as a successful benchmark for assessing students' basic information literacy skills at the course level. The project would not continue without the support of the library administration, fellow teaching librarians, English Department administration team and instructors. It is truly a collaborative and mutually beneficial experiment. Moreover, librarians at LAGCC never stop working to be part of the campus assessment cohort and would like to bring their expertise to an even higher level, collaborating with faculty for assessment opportunities that arise.

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Notes


5. Ibid., 157.


Appendix A: English 101 Library Session Survey Fall 2012

1) Have you attended a class session with a librarian?
   Yes                         No

2) Your professor wants you to find articles about teenage depression. Which search would be most effective?
   A. Articles about teenage depression
   B. Depressed teenagers
   C. Teenagers and depression
   D. Depression in teenagers

3) Is this a book or an article (circle one answer)?
   Answer:  Book       Article

4) Which link would lead you to the above screen? (circle one answer)
   Answer:   1       2       3       4
5) Is this a book or an article (circle one answer)?
Answer: Book  Article

6) Which link would lead you to the above screen? (circle one answer)
Answer: 1  2  3  4
Appendix 2 Library Instruction Survey since the Spring 2013

Library Survey
This survey is designed to determine the efficacy of the Library’s one-hour classes. This survey would take 5 minutes to complete. In order to maintain confidentiality, we are not collecting any personal or easily identifiable information. Participation is voluntary. For more information on this study, please contact Hong Cheng, Instruction Librarian, LaGuardia Community College at 718-482-6019.

1. What is your class section number? _______________ (For example, 0756)

2. How many credits have you completed at LaGuardia?
   A. 10 or less
   B. 11 to 20
   C. 21 to 30
   D. More than 30

3. Have you attended an instruction session with a librarian?
   A. Yes                      B. No

4. Which source is most likely to have a reliable article that is appropriate to include in a research paper?
   A. Google
   B. Subscription database
   C. CUNY+ catalog
   D. A .edu site

5. Your professor wants you to find articles about music censorship. Which search would be most effective?
   A. Articles about music censorship
   B. Music OR censorship
   C. Censorship AND music
   D. Censorship in music
The Role of a Required Information Literacy Competency Exam in the First College Year: What Test Data Can, Cannot, and Might Reveal

Kathy Clarke
James Madison University, USA

Abstract
James Madison University (JMU) has had a required information literacy competency exam situated within the first year of the university’s general education program for over a decade. This test, previously the Information Seeking Skills Test (ISST) and now, Madison Research Essentials Skills Test (MREST) is directly mapped to the Association of College & Research Libraries’ (ACRL) Information Literacy Standards for Higher Education. For many years, the only data regularly gathered noted if the students were passing, passing at the advanced level or not, and how the students performed on each objective. With this paper, the author explains how the test data is currently mined to discover more about the MREST and MREST test item behavior, score setting, and student performance comparisons of MREST passers versus non-passers. Each of these elements is further mined to learn more about what our students know, do not know, and need to know to successfully navigate a university information landscape.

Background
The James Madison University (JMU) general education program is a 41 credit hour program broken into five clusters. Cluster one are foundational courses, are completed in the student’s first year, and consist of nine credit hours and a required information literacy test—Madison Research Essential Skills Test/MREST. The nine credit hours are devoted to a critical thinking Course (3 hours), a first year writing course (3), and a communication course. Critical thinking courses can be delivered by any one of six academic departments (not a lot of commonality of content); a third of JMU students skip first year courses due to AP or IB credit. The most common elements in the first year course sequence are the communication course and the required information literacy test. JMU’s general education learning outcomes for information literacy are based on ACRL’s Standards for Information Literacy (2001). Failure to complete any part of Cluster one by the end of the first year results in an academic hold on the student’s account. Subsequently, the MREST is a high-stakes test, and student motivation to successfully complete it is high.

The JMU general education program is outcomes based. As long as the learning outcomes are covered, what or how the instructor teaches is largely up to them. But, every outcome in the general education program also must be assessed. This includes the information literacy learning outcomes that are not formally covered in a 15-week course.

The information literacy outcomes are taught via a tutorial that is delivered in two pieces; video tutorials that live on the libraries’ website (Madison Research Essentials Toolkit, available here: http://www.lib.jmu.edu/mretoolkit/) and exercises embedded into the learning management system (on our campus, Canvas) into each section of the basic communication course. Communications faculty assign the practice exercises and many require the completion of the MREST prior to exiting their course. This is done in tandem with students beginning to do research for presentations required in the course.

The MREST is a fixed-item, multiple-choice competency exam, and students take it until they pass. It is given in a proctored lab and students who repeat do not see the same test. All MREST items are mapped to an information literacy learning outcome.

For this presentation, I will focus our attention to the information literacy test, the MREST, and the data we generate from it. Many have asserted that test scores do not authentically indicate that students are actually learning or are able to apply what we may (or may not have) taught them in the
tutorial. Put another way, a new driver’s successful completion of a test of road signs is not the best indicator as to whether or not they can actually drive, so we can agree that fixed choice tests have a whole host of deficiencies.\textsuperscript{1} We are mandated by both our own institution and the State Council of Higher Education for Virginia (SCHEV) to assess what we say we teach, so we must have some mechanism to meet the mandate or remove the outcomes from the curriculum. With an incoming first year class of almost 4,500 students, getting 99.7\% to successful completion of the MREST prior to the end of their first year is an authentic competency measure. But through the years JMU has been capturing this information, and dutifully reporting out our successes, we did not give much thought to the richness that the data we were generating could tell us. We are now taking a much more robust look at what we can learn about our students as they work to achieve the MREST graduation milestone.

Tables 1 and 2 are traditional score reports and represent what we report out to meet mandates.

<table>
<thead>
<tr>
<th>Objective</th>
<th>ISST 2012-2013</th>
<th>MREST 2013-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Recognize that information is available in a variety of forms including but not limited to text, images and visual media</td>
<td>7 (6 per form)</td>
<td>12 (6 per form)</td>
</tr>
<tr>
<td>2: Determine when information is needed and find it effectively using a variety of reference sources</td>
<td>22 (20 per form)</td>
<td>22 (20 per form)</td>
</tr>
<tr>
<td>3: Evaluate the quality of information</td>
<td>4 (9 per form)</td>
<td>11 (9 per form)</td>
</tr>
<tr>
<td>4: Use information effectively for a purpose</td>
<td>5 (8 per form)</td>
<td>10 (8 per form)</td>
</tr>
<tr>
<td>5: Employ appropriate technologies to create an information-based product</td>
<td>0 (2 per form)</td>
<td>2 (2 per form)</td>
</tr>
<tr>
<td>6: Use information ethically and legally</td>
<td>4 (5 per form)</td>
<td>5 (5 per form)</td>
</tr>
</tbody>
</table>

Findings: ISST/MREST Scores by Objective

Table 2

Students meeting the standard by May 9, 2014
This is shown as a percentage of the students who attempted the test at least once.

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>N</th>
<th>% of students</th>
<th>number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISST*</td>
<td>2012–2013</td>
<td>3916</td>
<td>97.7%</td>
</tr>
<tr>
<td>MREST**</td>
<td>2013–2014</td>
<td>4042</td>
<td>98.9%</td>
</tr>
</tbody>
</table>

*36\% of the students (1426) who attempted the ISST met the “Advanced” criteria.
Note: the percentage meeting the standard out of all first year students who were notified that they needed to take the test (N = 4388) was 87\% for ISST.

This content also helps us understand how well the students are doing on the test by objective. If we see a dip or scores we are unhappy with (as is the case in Objective 6 above), we can revise the tutorial, check on the performance of the test questions, and revise either one.
We can also set goals. We are using the data seen in Table 2 to inform library strategic planning. We used the year 2013–14 as a baseline score setting year. With this data, we will see if we can improve the number of students who can pass the test on the first attempt, and we can measure the cost of improving those scores. Do we need more personnel, to do what and where? Whether it is worth it and how will we measure that is still to be determined.

Substantial changes to the MREST have been made since 2011, including renaming the test to match the name of the tutorial. These changes indicated we needed revisit our cut scores (proficient and advanced). The cut scores were set via a bookmarking method—instructional faculty and librarians looked at test items from easiest to hardest (based on students’ performance). This bookmarking session occurred in summer 2013. Bookmarking improved MREST reliability and validity.

At the beginning of fall 2013, we were worried we had set the score too high. Many students were complaining that they simply could not pass the test. Student test score data from 2013–14 indicate that they were in fact passing and we were just hearing from a loud, vocal minority.

We also spend a lot of time looking at individual test item behavior. We compare students who pass on the first attempt versus those who do not by objective.

<table>
<thead>
<tr>
<th>IL Objective</th>
<th>Passers % Mean Correct</th>
<th>Non-Passers % Mean Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>45%</td>
<td>37%</td>
</tr>
<tr>
<td>2</td>
<td>51%</td>
<td>40%</td>
</tr>
<tr>
<td>3</td>
<td>73%</td>
<td>61%</td>
</tr>
<tr>
<td>4</td>
<td>76%</td>
<td>67%</td>
</tr>
<tr>
<td>5</td>
<td>79%</td>
<td>65%</td>
</tr>
<tr>
<td>6</td>
<td>82%</td>
<td>73%</td>
</tr>
</tbody>
</table>
This data indicates that the tutorial could use some tightening up across the board to pull up the first-time passers to an advanced score and pull up many of the first time non-passers to a proficient score. That work is occurring, and we will use academic year 2014–15 data to see if the changes have improved both overall scores as well as increased the number of first-attempt passers.

Test items that go on the MREST go through a pilot year. In that pilot year, students taking the test see the items, but they are not counted in their final score. Only items that behave well make it onto the operational (scored) MREST. If we cannot see a difference between students who do well on the test and students who do poorly on an individual item, the item will not make it onto the operational MREST. So for instance, in the item analysis below, there is not much difference between passers and non-passers on this item. This indicates that this item is too easy and we should either make the item somewhat more difficult or remove the item altogether. This analysis ensures reliability and test validity.

Better item behavior will show a difference between students who do well on the test vs. those who do not. This is an example of a beta item from 2011 that performed well enough to make it onto the operational MREST.

Backwards translation is another way of improving validity. In fall 2012, graduate students from James Madison University’s Center for Assessment and Research Studies conducted a backwards translation study of the MREST. Each item was presented to the graduate students, and they had to choose if an item “mapped” to the objective it was assigned by the item writer. This allows for multiple sets of eyes to monitor whether the test is correctly assigned to the right objective.
many items, the graduate students agreed with the objective map, but in just as many they did not. This kind of work also assists a test author to see patterns among items that seem easily map-able and those that do not.

We can use our data to make improvements to the tutorial and test and monitor student performance. Right now, we are currently revising the tutorial to see if we can improve the students’ scores and meet the libraries’ strategic goal to see more students pass at the advanced level. We will do a preliminary check at the end of fall 2014 to see if we are making progress.

**Conclusion**
Collecting data due to mandates will meet the mandates, but it probably will not help you improve what you are doing. At JMU, I am fortunate to have the opportunity to use our mandates to improve student learning by creatively using our data to study student learning by outcome, intervention strategy (tutorial) improvements, test reliability and test item interpretation. Further study of student artifacts (can they drive) will commence in the spring of 2015 and we hope will further inform our tutorial/test model.

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**Endnotes**
Libraries and Student Success: A Campus Collaboration with High Impact Educational Practices

Kathryn M. Crowe
University of North Carolina at Greensboro, USA

Abstract
Academic libraries work closely with all learning activities and practices at their institutions. At a high research public university the current strategic plan uses the Association of American Colleges and Universities’ (AAC&U) High Impact Practices to develop its curriculum and general education program. The university libraries work closely with academic and student affairs units to collaborate on several high impact practices. To provide solid evidence and demonstrate how the libraries contribute to high impact practices, an extensive report was prepared with specific examples of activity from one academic year. The report was widely distributed on campus so that the chancellor, provost, deans and other academic leaders would be informed of the libraries’ significant value and impact on student success. This article focuses especially on learning communities, proven to affect student success positively.

Introduction
Academic libraries are actively exploring reliable methods to demonstrate their value and impact on student success and retention to campus administrators and governing bodies. An effective way to show the library’s value is to align closely with the educational practices employed on campus and document activities with solid data. Many campuses are moving from the teaching to learning paradigm and adopting the Association of American Colleges and Universities’ (AAC&U) essential learning outcomes as outlined in their Liberal Education and America’s Promise (LEAP) project. Part of the learning paradigm is implementing high impact practices in the effort to improve retention, persistence, and success. These practices have been rigorously researched and proven to be successful. Libraries participate in many high impact practices through information literacy programs and collaborations with student affairs, service learning, and undergraduate research. One way to demonstrate library contributions to student success is to work closely with these successful high impact practices and provide evidence of activity.

In 2007 and 2008 the AAC&U published two reports to address the future of 21st century higher education, College Learning for the New Global Century (2007) and High-Impact Educational Practices (2008). Both reports drew heavily from the research of George H. Kuh and others and their analysis of data from the National Survey and Student Engagement (NSSE). The first, commonly referred to as the LEAP report, identified several “essential learning outcomes” needed by 21st century graduates in order to be successful:

- Knowledge of human culture and the physical and natural world
- Intellectual and practical skills
- Personal and social responsibility
- Integrative learning

The LEAP report recommended that liberal education must transform itself in order to prepare students for the challenges of the 21st century global society.

The second report identified 10 high-impact educational practices that support the essential learning outcomes:

- First-year seminars and experiences
- Common intellectual experiences
- Learning communities
- Writing-intensive courses
- Collaborative assignments and projects
- Undergraduate research
- Diversity/global learning
- Service learning
- Internships
- Capstone courses

The report also provided evidence of positive effects associated with participating in high-impact
activities based on NSSE responses from both first-year students and seniors. These practices work because they require students to devote time and effort to purposeful tasks and demand interaction and feedback with faculty and peers on substantive issues. Participating in high impact activities increases the possibility that students will experience contact with diverse people. The opportunities for study abroad and service learning enable students to apply their learning to other settings and experience life-changing opportunities.

Learning Communities in Higher Education
One high impact practice that is widely adopted and researched is learning communities, part of the higher education landscape for over 40 years. They are usually characterized by students taking at least two linked courses as a group and working closely with the professor and each other. Often they explore a common topic and examine it through the lens of different disciplines. Some learning communities include a residential component referred to as living learning communities. Recent research provides evidence on the impact of learning communities on student engagement, performance, and retention.

Libraries and Learning Communities
Academic libraries have a history of collaborating with learning communities, primarily as a way to integrate information literacy skills into the curriculum. Over a decade ago, Joan Lippincott recommended that librarians work with learning communities as a way to “a deeper understanding of the information needs of students and faculty and establish librarians as partners in the learning enterprise in new and important ways.” In a 2006 literature review, “Information Literacy and Integrative Learning,” Galvin reported on several ways librarians worked with learning communities, including paired for-credit courses and course-related information literacy instruction. A few studies assessed librarians’ involvement with learning communities. In 2006, Lebbin used focus groups to assess a Library Studies 100 course that was linked with a freshman English course at the University of Hawaii at Manoa. Participants noted that it was a very valuable experience to learn basic information literacy skills early in their college career. In addition, they gained important skills to apply to other courses such as the ability to locate sources, recognize scholarly sources, and apply citation skills. Voelker also used focus groups to assess librarians’ involvement with learning communities at Kent State University. They determined it was a useful way to contribute to the retention of at-risk students. Several librarians embedded in learning communities and not only provided information literacy sessions but also sessions on plagiarism, careers, and sponsored pizza study breaks. Through the focus groups they learned that the students really appreciated the services from the library and even asked for more! The library hoped to expand involvement with learning communities based on the focus group feedback.

Learning Communities at the University of North Carolina at Greensboro
The University of North Carolina at Greensboro (UNCG), one of seventeen campuses of the University of North Carolina system, is a high research activity university and also earned a “Community Engaged Classification” from the Carnegie Corporation. In 2013–14 the enrollment included 13,640 undergraduates and 2,666 graduate students. With distance learners, the total headcount was 17,707. UNCG has sponsored living learning communities (LLCs) for over 40 years. The Warren Ashby Residential College (WARC), established in 1970, was among the first of its kind in the nation. WARC provides on-site classes and faculty offices in the residence hall, academic advising, and a small student-faculty ratio. A coordinator teaches in WARC and is also responsible for housing and community-building aspects. In the 1990s, UNCG added several new LLCs with varying emphases. When the current chancellor arrived in 2008, UNCG embarked on a new strategic plan for 2009–14 and used the LEAP Report as a major source. The plan focused on the importance of student success with an emphasis on retention and graduation rates. Learning and living learning communities were articulated as a priority to provide students with a more engaged and integrated learning experience. One goal of the plan specifically focused on learning communities:

- Implement first-year learning communities for all first-time UNCG undergraduate students to encourage integration of learning across courses (Learning Communities)
UNCG currently offers over 30 living learning communities, learning communities, or residential colleges. By fall 2013, approximately 50% or 1,300 first-year students participated in LCs. Residential colleges focus more on the experience of living together and taking general education classes together while working closely with faculty. Other communities center on taking paired classes in specific subject areas. Topics include a wide range from entrepreneurship, teaching, science and health, and multiculturalism. Others offer the opportunity to explore a variety of majors.

The university has data that indicate retention rates and GPAs are higher for students who participate in LCs. The retention rate for those in the residential colleges is 87% as opposed to an average of 77% for the university as a whole. Furthermore, all learning communities report a 10% higher GPA average above the UNCG. The UNCG University Libraries and Learning Communities

The libraries have a history of involvement with learning communities, beginning in 2007 when we assigned liaisons to the learning communities as part of our Student Affairs Connection Program. Liaisons work closely with their communities to provide information literacy sessions and workshops on specific tools and topics such as citations and plagiarism. They also offer satellite reference and in-depth consultations. Libraries’ faculty teach sections of UNCG’s acculturation courses, some of which are paired with LCs. One librarian has been a faculty fellow of an LLC for years. In WARC, mentioned above, the liaison trained a student to serve as a primary communication line between the students and the libraries. On a lighter note, liaisons provide co-curricular activities such as game nights, mystery nights, and participate in LC social activities.

The libraries were heavily involved with the strategic planning committee that established LCs across campus with both the libraries’ dean and first-year instruction coordinator serving on it. The first-year instruction coordinator also joined an eight-member team that attended the 2010 National Summer Institute on Learning Communities. The increased emphasis on LCs in the strategic plan also provided the opportunity for the libraries to augment this relationship and integrate more fully into the curriculum. Liaison assignments were expanded to all LCs. Specific outcomes for liaisons were identified:

- Library liaisons to the LLCs will increase contact and embed further with their communities in order to establish closer communication and to ensure that students utilize the libraries’ resources and services. Contact may be whatever is appropriate for the community and may include, but is not limited to, office hours, information literacy classes, UNS 101-type courses, training student peer mentors, and general programs.
- Liaisons will gather data such as number of questions asked, hours on site, classes, program attendance, and student feedback.
- Data will be collected at the end of the academic year and a report developed. We might hold a summit with the LLCs or participate in a program already happening to report our results.

As the libraries sought to show how we contribute to retention and student success we determined that a useful method would be to document our support of these high impact practices. This method was recommended in Steven Bell’s “Keeping Them Enrolled: How Academic Libraries Contribute to Student Retention,” a 2008 Library Issues Briefing. Bell interviewed George Kuh, who stated,

...that academic librarian may indirectly affect student success through their interactions with students and by helping them acquire needed research and information literacy skills and competencies. By establishing rapport with students, librarians can help foster a supportive campus environment which has salutary effects on student engagement and achievement.

Bell further stated that there is ample research that indicates that student engagement contributes to student success and that academic libraries can play a strong supporting role in these activities.

We built on data already collected and prepared a very detailed report documenting our significant contributions to all high impact practices. For each practice we provided background information on how the practice operates at UNCG, mapped our activities to the practice, and provided statistics for
one academic year to illustrate the level of support. For the learning communities section we included each LC, named the liaison, and provided narrative and bullet points for the activities and statistics. The overall evidence that supported learning communities included:

- 41 information literacy sessions
- Embedded librarian in Ashby Residential College
- 2–4 office hours/week
- Research consultations
- Developing LibGuides
- Attending final presentations or posters
- Assignment design
- Librarian “lab sessions” with students
- Research consultations
- Workshops for instructors

The report was widely shared on campus with the provost, student affairs, and academic deans and placed in our institutional repository. We also shared it in the library community in North Carolina and received very positive comments and feedback. The report proved very valuable for other situations as well. The university faced major budget cuts in 2013–14 and all academic units were asked to document how they support student success. We were easily able to pull from the high impact report to provide this information. In 2014 we welcomed a new provost and one of the first items the libraries’ dean sent her was this report. We plan to update the statistics each year so that we continue to demonstrate our continuing collaboration with the high impact educational practices at UNCG.

Recommendations

Academic libraries are closely interconnected with student learning through information literacy programs and collaborations with student affairs, service learning, undergraduate research and other student programs. We work closely with the educational practices employed at our institutions that strengthen student success. Through these collaborations we contribute much to student success and retention. We all keep statistics and generate reports for our activities. An effective strategy to demonstrate our value is to map these statistics to the educational practices and provide documentation to campus administration. The documentation needs to be presented in a visually pleasing manner, easily accessible to campus administrators, and distributed as widely as possible.

Notes


2. Ibid., 17–18.


4. Ibid., 15–17.

5. Ibid., 10.


8. Galvin, Jeanne, “Information Literacy and Integrative Learning,” *College & Undergraduate Libraries* 13, no. 3


17. Ibid., 157.


19. Ibid., 1.

Abstract
Librarians face numerous challenges when designing effective, sustainable assessment methods for student learning outcomes in one-shot, course-integrated library instruction sessions. We explore a flexible assessment practice of using rubrics to programmatically assess authentic learning exercises students complete in one-shot library sessions for a large, required sophomore level research and writing class. We discuss our findings, as well as how results are used and subsequently impact our information literacy initiatives on a programmatic level. This assessment model is scalable and can be adjusted for size, time, and class content.

Introduction
Librarians face numerous challenges when designing effective, sustainable assessment methods for student learning outcomes in one-shot, course-integrated library instruction sessions. By their nature, one-shot library classes are limited in time, requiring librarians to ensure that assessing student learning does not encroach on the learning itself. Additionally, coming to a mutual agreement on student learning outcomes can present difficulties when multiple librarians teach library classes, as is often the case at large universities. We explore a flexible, sustainable assessment practice of using rubrics to programmatically assess authentic learning exercises students complete in one-shot library sessions. This assessment model is scalable and can be adjusted for size, time, and class content.

Rubric-based assessment is grounded in “assessment for learning theory,” which suggests that assessments can be tools for learning and allow us to evaluate an authentic product of student learning as opposed to a test that exists exclusively for assessment purposes. Accordingly, this approach provides students opportunities for active learning while achieving librarians’ assessment goals. Designing and using a rubric also increases shared understanding of learning outcomes between multiple librarians teaching the same course, increasing programmatic cohesion and consistency.

Rubric-based Assessment at Virginia Commonwealth University
At Virginia Commonwealth University (VCU), we implemented this model to assess student learning outcomes in library instruction sessions for a required sophomore-level research and writing course called University 200: Inquiry and the Craft of Argument (UNIV 200). Librarians provide instruction for all of the approximately 80 sections offered each semester. To assess student learning in these sessions, we developed a worksheet and a rubric based on information fluency learning outcomes defined with UNIV 200 faculty.

Data Collection
The worksheet invites students to identify the most important words in their research question, develop additional search terms based on those words, and then connect those search terms for a coherent search strategy using Boolean operators. They then look for search terms to be truncated. Finally, students search for resources relevant to their topics using VCU Libraries’ discovery tool and document their findings on the worksheet. Librarians then scan worksheets from each class and return the original copies to students.

Data Analysis
At the end of each semester, librarians select a disproportionate stratified random sample of worksheets (three worksheets per class) for assessment. Those that are less than halfway complete or that are illegible are removed from the sample. In 2013–2014, our sample of worksheets totaled 258. Of those, 82 were collected in fall 2013, and 176 were collected in spring 2014. Two reviewers then complete a norming process to
ensure shared understanding of the rubric. The reviewers then score each worksheet based on six criteria established in the rubric, with maximum scores ranging from 2–3 points for each criterion. The potential maximum score for a student’s completed worksheet is 17 points. Student scores are the average between the two reviewers’ scores for each criterion and the total score for each worksheet. The inter-rater reliability for each criterion ranged from moderate to substantial based on Landis and Koch’s parameters (see Table 1).

Table 1: Inter-rater Reliability for Rubric Criteria

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
<th>Cohen’s Kappa (K)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Student clearly states research question.</td>
<td>.501</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>B</td>
<td>Student identifies important words/concepts.</td>
<td>.338</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>C</td>
<td>Student develops related search terms.</td>
<td>.334</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>D</td>
<td>Student connects terms with Boolean operators.</td>
<td>.689</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>E</td>
<td>Student truncates search terms as appropriate.</td>
<td>.677</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>F</td>
<td>Student identifies two relevant resources.</td>
<td>.725</td>
<td>&lt; .05</td>
</tr>
</tbody>
</table>

Results and Discussion

Overall, mean scores indicate that students did well in identifying the most important words in their research question and connecting their search terms with Boolean operators (See Table 2). They demonstrated some success in thinking of related search terms and finding relevant resources, and performed most poorly on truncating search terms. Although students’ average scores for stating their research question was fairly good, this particular criterion was designed not to indicate the quality of the research question, but simply whether or not it was presented in such a way that we could understand it. It was primarily used to remove worksheets from the sample with research questions so poorly articulated that we could not assess the quality of the rest of the worksheet. Thus, the mean score is not a reflection of quality of research questions.

Table 2: Mean Scores for Each Rubric Criterion, 2013–2014

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
<th>Mean score</th>
<th>Max score possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Student clearly states research question.</td>
<td>1.82</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>Student identifies important words/concepts.</td>
<td>2.42</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>Student develops related search terms.</td>
<td>1.99</td>
<td>3</td>
</tr>
<tr>
<td>D</td>
<td>Student connects terms with Boolean operators.</td>
<td>2.45</td>
<td>3</td>
</tr>
<tr>
<td>E</td>
<td>Student truncates search terms as appropriate.</td>
<td>1.24</td>
<td>3</td>
</tr>
<tr>
<td>F</td>
<td>Student identifies two relevant resources.</td>
<td>2.02</td>
<td>3</td>
</tr>
</tbody>
</table>

We observed a statistically significant difference ($p < .05$) in students’ overall average scores in class sessions that were 50 minutes long ($M = 11.67$) and 75 minutes long ($M = 12.33$), with an effect size of $d = .31$. We believe the reason for this to be quite evident: in 75 minute sessions, both librarians and students are able to devote 50% more time to achieving learning outcomes.

We noted improvement in every criterion and overall average score between fall 2013 and spring 2014, although the differences were only statistically significant for criterion F and for overall score (see Table 3).
Table 3: Comparison of Scores between Fall and Spring Semester

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
<th>Fall M</th>
<th>Spring M</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Student clearly states research question.</td>
<td>1.79</td>
<td>1.84</td>
<td>&gt; .05</td>
<td>--</td>
</tr>
<tr>
<td>B</td>
<td>Student identifies important words/concepts.</td>
<td>2.37</td>
<td>2.44</td>
<td>&gt; .05</td>
<td>--</td>
</tr>
<tr>
<td>C</td>
<td>Student develops related search terms.</td>
<td>1.97</td>
<td>1.99</td>
<td>&gt; .05</td>
<td>--</td>
</tr>
<tr>
<td>D</td>
<td>Student connects terms with Boolean operators.</td>
<td>2.44</td>
<td>2.46</td>
<td>&gt; .05</td>
<td>--</td>
</tr>
<tr>
<td>E</td>
<td>Student truncates search terms as appropriate.</td>
<td>1.16</td>
<td>1.30</td>
<td>&gt; .05</td>
<td>--</td>
</tr>
<tr>
<td>F</td>
<td>Student identifies two relevant resources.</td>
<td>1.77</td>
<td>2.13</td>
<td>&lt; .05</td>
<td>.31</td>
</tr>
<tr>
<td>Overall</td>
<td>Average score of all combined criteria.</td>
<td>11.45</td>
<td>12.16</td>
<td>&lt; .05</td>
<td>.33</td>
</tr>
</tbody>
</table>

Although not statistically significant, we were pleased to see an increase in student scores on Criterion E (truncation), an area in which we had focused on increasing student learning based on poor performance in fall 2013. We suspect the increase in Criterion F (finding relevant sources) was based in part due to our increasing commitment to allowing students ample time to search for information during the class session, as well as significant improvement in the relevance sorting of our libraries’ discovery tool, Primo.

We use assessment results at the end of each semester for a variety of purposes. Although we are only reporting data from 2013–2014 here following approval from VCU’s institutional review board, we have been using this method of assessment for 2-plus years, and benefitted from the results each semester as a catalyst for reflection, communication, and decision making. The reflective benefit of reviewing these results each semester cannot be understated: it allows us to learn from each other and share ideas for how to improve student learning, and creates cohesiveness in our 4–6 person team, compelling us to reconnect with learning outcomes for the sessions we offer and focusing our efforts. We have shared yearly data with UNIV 200 professors and with library administration. Some of the assessment results and methods were used in our most recent SACS reaccreditation process.

Finally, this process has helped us enact decisions, an important step in the Information Literacy Instruction Assessment Cycle. The best example of how we used the data to enact decisions is our subsequent change in how we approach truncation. We began by devoting additional attention to this concept and reconsidering how we teach it, since students found it hard to grasp. Over time, though, after seeing only minimal improvement in students’ understanding of this concept, coupled with the more ‘Google-like’ search functions of our discovery tool, we decided to eliminate truncation from UNIV 200 instruction unless requested.

Application to other environments

We have shared one instance of how rubric-based assessment of authentic learning products were used for UNIV 200 library sessions at VCU. However, one of the model’s greatest strengths is its ability to be applied in a variety of scenarios. It is a model that works well for one-shot instruction, embedded instruction, or for credit-bearing classes. It works for all types of content, and fosters active and applied learning in all cases. The process of implementing this type of model consists of six steps that are applicable to a variety of circumstances:

1. Define learning outcomes.
2. Create authentic learning exercise to measure outcomes.
3. Develop rubric to score learning exercise.
5. Learn and change from your data.
6. Repeat.
Conclusion
Using rubrics to assess authentic learning exercises in course-integrated library instruction has proven a useful way to measure student learning while also providing additional opportunities for students to apply their new skills at Virginia Commonwealth University. This model’s ability to be applied to a variety of instructional settings and its ability to enhance student learning are its greatest strengths.

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Endnotes


Charting Your Course: Using Curriculum Mapping to Enhance Information Literacy

Susan Gardner Archambault
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Abstract
Curriculum mapping is a procedure for visualizing student learning at the programmatic level in order to deconstruct the curriculum. It allows libraries to record where information literacy skills are taught throughout the curriculum in order to locate gaps and redundancies in a library instruction program. Libraries can use curriculum mapping to identify “high impact” courses within each department or program of study and target these courses for information literacy. This paper presents a case study of how Loyola Marymount University (LMU) launched a “curriculum mapping project” to support information literacy in a new core curriculum.

Introduction
Information literacy instruction needs to happen at the programmatic level rather than through individual courses alone. One procedure that helps librarians work with faculty to make library instruction “an organic and immersive process, not a one-time effort” is curriculum mapping. Curriculum mapping was developed in the 1980s for primary and secondary education, and broadened in the 1990s through the work of Heidi Hayes Jacobs. Curriculum mapping is a way to visualize information about what students learn over time and deconstruct the curriculum. A curriculum map allows you to trace a student’s development throughout the curriculum. Curriculum mapping can be plotted in a grid, linear, or “rubric” format, or there is visualization software available for concept mapping. The maps, or “inventories,” in a curriculum map provide “an overview of students’ learning journey—a place to locate where educational opportunities are specifically designed to address institution and program-level expectations.”

Curriculum mapping serves many purposes, including greater familiarity with a department’s curriculum, charting learning outcomes and skills progression, identifying collaborative possibilities, making the curriculum more transparent for all stakeholders, and helping all stakeholders speak departmental language. Libraries that perform curriculum mapping can see “where information literacy skills are taught throughout the curriculum…and locate gaps in student learning as well as places where instruction is being needlessly repeated.” This allows librarians to work with faculty to become more strategic about the placement and timing of information literacy across each discipline. Several libraries have reported on their efforts to use curriculum mapping to enhance information literacy, including UNLV, Oxford College, The Claremont Colleges, and Long Island University.

Institutional Context
The curriculum mapping project at LMU grew out of a need to plan for a comprehensive and sequential library instruction program that could be integrated into a new undergraduate core curriculum. In 2010, LMU’s Faculty Senate voted to adopt new University Undergraduate Learning Goals and Outcomes. One of the learning outcomes addressed information literacy; it stated, “students will be able to identify information needs, locate and access relevant information and critically evaluate a diverse array of sources.” This university-level outcome was a catalyst for the development of complementary program-level learning outcomes related to information literacy for the new undergraduate core curriculum. The new core was implemented in 2013, and through the LMU Core, students will be able to “collect, interpret, evaluate and use evidence to make arguments and produce knowledge” and also “identify information needs, locate and access information and critically evaluate sources.” Information literacy concepts are embedded into course-level learning outcomes for three required courses in the new LMU Core. The outcomes are measured through online tutorials created by LMU.
Archambault

librarians, as well as assignments and grading rubrics developed collaboratively by faculty and LMU librarians. Information literacy is introduced at the course level in the fall of a student's freshman year during a First Year Seminar course, reinforced in the second semester during a Rhetorical Arts course, and then enhanced within a student's major at least once at the sophomore level or higher through a course that is “flagged” for information literacy. LMU students are required to take courses that integrate specific skills into disciplinary coursework, including writing, oral communication, quantitative reasoning, engaged learning, and information literacy. To “flag” a course for information literacy, each department must submit a proposal that is signed by their chair and dean. The flagging process is ongoing, and many departments are still considering which course(s) to flag. The curriculum mapping process evolved as a way for librarians to help each department systematically review information literacy across their curriculum in order to determine which courses to formally “flag” for information literacy.

Purpose
This paper presents a case study of how Loyola Marymount University (LMU) launched a “curriculum mapping project” to support information literacy in a new core curriculum. Subject librarians at LMU are completing a curriculum map for every undergraduate major degree program on campus. The purpose is to pinpoint strategic information literacy opportunities within each department, discipline, or program. Upon completion of each curriculum map, librarians share the results with that department and give recommendations. This process is creating a more comprehensive and sequential information literacy program that is better integrated into the undergraduate core curricula.

Design
A set of curriculum mapping instructions and a blank curriculum map template were created for all subject librarians. The instructions ask librarians to first make a note of any departmental learning outcomes or departmental accrediting body learning outcomes related to information literacy. Then the librarian identifies the required “core” courses within each major/program of study and lists them on the template as well as the electives. Brief course descriptions are listed, and librarians obtain copies of the course syllabi from the department in order to perform a content analysis for each course. After reading through each syllabus, existing or potential learning outcomes and assignments related to information literacy are identified (see Figure 1).
Specifically, librarians are looking for evidence of student participation in the following LMU information literacy dimensions:

1. Identify an information need through a research topic or thesis
2. Find information beyond assigned course readings
3. Evaluate sources by differentiating between them and using criteria such as rationale/bias, authority, date/currency, accuracy, and relevance
4. Use evidence to make arguments by integrating information beyond the assigned course readings
5. Information ethics through the demonstration of proper acknowledgement of others’ work

These information literacy outcomes, when found, are mapped to the corresponding course(s) on the curriculum map. Finally, assessment of the learning outcomes is also mapped out. The curriculum mapping instructions offer tips for resolving common ambiguities in the mapping process, such as multiple sections of the same course having different learning outcomes or courses that are cross-listed within multiple departments. Also, librarians are encouraged to use the official course descriptions in the LMU Bulletin and the list of courses that requested library instruction over the last two years from the library instruction coordinator as additional resources.

**Findings**

Each librarian recommends courses that are most strategic to embed information literacy instruction into so more students will benefit within each major. Courses that are required for the major and could naturally build on foundational information literacy skills taught in freshman core curriculum courses are identified as a top priority (see Figure 2).
The process of mapping out learning outcomes related to information literacy at the department and course levels has led to the identification of “high impact” courses within some departments that can be “flagged” for enhanced information literacy instruction in the new core curriculum. The curriculum mapping is still underway, but librarians have already successfully persuaded forty-six departments to formally embed information literacy into their courses.

Practical Implications
Curriculum mapping offers many benefits to libraries, including the chance to become more familiar with each department’s curriculum. It provides opportunities to systematically review information literacy across all disciplines and forge new faculty partnerships. It helps libraries avoid duplication and gaps in information literacy instruction so that the placement and timing of information literacy across each discipline can become more strategic. Curriculum mapping helps answer the question of what the place is for information literacy in the curriculum as a whole.

Notes

2. Ibid., 331.


5. Ibid., 62.

7. Moser et al., 332.


11. Katherine Boss and Emily Drabinski, “Looking for InfoLit: Using Syllabi to Map Strategic Information Literacy Instruction” (7th International Evidence Based Library and Information Practice Conference, July 15–18, 2013, Saskatoon, Saskatchewan, Canada), http://eblip7.library.usask.ca/docs/Boss_Drabinski_EBLIP7_presentation.
Assessing Information Literacy in General Education: A Collaborative Approach Using a Metarubric

Anne Pemberton and Linda Siefert
University of North Carolina Wilmington, USA

Abstract
Metarubrics can serve as effective tools for assessing skill sets, such as information literacy, across the general education curriculum. Metarubrics are designed to assess the competency level of students at the program or institutional level rather than being used to grade a student’s submitted assignment for a specific course. At the University of North Carolina Wilmington (UNCW) the “Valid Assessment of Learning in Undergraduate Education” (VALUE) metarubrics created by the Association of American Colleges & Universities’ (AAC&U) LEAP project have been used for this type of assessment since 2008. The university’s director of general education assessment has involved faculty across the campus, including librarians, in the process of applying metarubrics to a variety of student assignments in various disciplines to determine information literacy competency. Librarians have participated as scorers as well as “information literacy experts” to assist faculty through the process of norming and scoring using the information literacy metarubric. The benefits and challenges of using metarubrics will be shared as well as changes that the university has made over time to the information literacy metarubric. The process of recruiting faculty and the specific procedures undertaken to complete assessment will be shared. The results of information literacy assessment for multiple years will also be provided. In addition, the information literacy requirement in the UNCW general education curriculum will be reviewed.

Background
The University of North Carolina Wilmington (UNCW) is one of 17 schools within the University of North Carolina (UNC) system. The enrollment is just under 14,000 with 12,387 undergraduate students enrolled in the fall of 2014. The number of full-time faculty members is 639, and there are 388 part-time faculty members. UNCW offers 52 bachelor’s degrees, 38 master’s degrees, and two doctoral programs, one in marine biology and one in educational leadership. UNCW is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACS COC). William Madison Randall Library is the main library supporting the campus. There are 21 librarians, ten of which provide instructional services to students, faculty, staff, and community users. In academic year 2013–2014, librarians taught 480 instruction sessions to 11,204 users.

New General Education Curriculum
In January 2004, UNCW began a revision of its general education curriculum, known at the time as “Basic Studies.” A faculty senate task force made recommendations for a revised curriculum to faculty senate in the spring of 2006. These recommendations did not include an information literacy requirement. However, information literacy was referenced as one of eight university learning goals. The other seven university learning goals are: Foundational Knowledge, Inquiry, Critical Thinking, Thoughtful Expression, Second Language, Diversity, and Global Citizenship.

In January 2007 a new committee made additional recommendations for revisions of the general education curriculum; one recommendation being a requirement related to achieving information literacy. The revised curriculum was later renamed “University Studies” and was implemented in the fall of 2012.1

Students are required to take nine hours of information literacy “intensive” courses to complete the information literacy requirement. Students are expected to take First Year Experience, which is considered an information literacy intensive course, and two additional information literacy intensive courses, with at least one in the student’s major. The ideal and typical path for a student who is native to UNCW would be to take First Year Experience in the first semester, College Writing and Reading II (also an
information literacy intensive course that satisfies the composition requirement) in the sophomore year, and one information literacy intensive course in the student's major during their junior year. In addition to information literacy intensive courses, courses in other components of the general education and major curriculums are aligned with the UNCW Information Literacy learning goal.

In order to be considered an information literacy intensive course, department chairs must submit a form to the University Studies Advisory Committee, which reviews all proposals. In the proposal, information literacy intensive courses must demonstrate that their student learning outcomes, teaching opportunities, and assessment methods align with each of the Information Literacy Competency Standards for Higher Education created by the Association of College and Research Libraries. UNCW has adopted these standards as their student learning outcomes for information literacy. It should be noted that university personnel are aware of the upcoming change from the standards to “The Framework.” A rubric is used by committee members to score the course proposal, and scores determine approval for the University Studies curriculum.

The Role of the Library
Librarians at UNCW have been engaged throughout the revision of the general education curriculum with membership on the University Studies Advisory Committee and in working to assist faculty with information literacy intensive courses. Currently, the library instruction program is scaffolded in an effort to align with the University Studies courses and the traditional path or progression of courses that a student would most likely take. Librarians teach one instruction session to all First Year Seminar (FYS) students and provide the same students with a textbook chapter, a quiz, and an out of class assignment. English Composition instructors are strongly encouraged to have information literacy sessions with librarians to build upon the FYS sessions. These sessions typically occur during the sophomore year of a student’s academic career. In most majors, librarians are asked to lead information literacy sessions for faculty in the courses approved as information literacy intensive in the major. All FYS information literacy instruction sessions have the same student learning outcomes and the English Composition information literacy instruction sessions have a different set of identical student learning outcomes that build upon the FYS outcomes. This is purposeful in that the goal is for students to be exposed to the scaffolded content as they progress through their academic careers at UNCW and for students to progress into their major with a basic level of information literacy skills. Librarians assess information literacy instruction in various ways including in class worksheets, quizzes, out of class assignments scored using rubrics, etc.

General Education Assessment
At UNCW, general education student learning outcomes assessment is accomplished through a variety of methods at multiple levels: at the assignment level, course level, major level, and university wide. Beginning in the 2008–2009 academic year, UNCW began utilizing metarubrics to assess several of the university’s learning goals, including information literacy.

The director of assessment for both general education and the College of Arts and Sciences at UNCW oversees the assessment process for all University Studies courses, including those in the information literacy “component.” Courses with student learning outcomes that are aligned to UNCW’s Learning Goals² and are representative of those taken by most students are selected for assessment. Sections are selected by stratified random sampling and students within sections are selected randomly. Student work products are collected and assessed.

Using Metarubrics
Several Association of American Colleges & Universities VALUE (Valid Assessment of Learning in Undergraduate Education) Rubrics³ are aligned to the UNCW Learning Goals. These rubrics are used to score student work products from general education courses and senior capstone courses. These “metarubrics” are meant to assess a collection of student work across disciplines and across assignments. They are designed to assess the competency level of students at the program or institutional level rather than being used to grade a student’s submitted assignment for a specific course. Whereas a rubric may be used to assess one specific assignment in one specific course, a metarubric can be applied to multiple assignments in multiple courses. Using a metarubric assumes that there are commonalities across
assignments/student work products and that these commonalities can be judged by a common set of criteria. For example, a research essay assignment in an art class, a background literature review for a biology lab experiment, and a research paper in English composition can all provide similar opportunities to practice the common dimensions of information literacy. The specifics of the assignment vary, but the common criteria remain the same.

The Process
A workshop is held to acquaint or reacquaint instructors who will be providing student work products with the rubric(s) and process prior to the beginning of the semester. Instructors select an assignment that they believe matches most or all dimensions of the rubric. Faculty scorers are selected from a pool of volunteers who are willing to commit to a two hour rubric norming workshop and to a half day or full day scoring session. “Experts” for the learning goals being assessed in that semester's cycle are on hand to assist with questions related to that learning goal and/or the associated rubric. A librarian has served as the information literacy “expert” since this assessment process began. During the half day or full day scoring session, faculty scorers work on packets of student work products in pairs and multiple work products are double scored to measure interrater-reliability using Percent Agreement, Spearman’s Rho, and Krippendorff’s Alpha.

For information literacy student work products, faculty scorers examine a course’s assignment and then use the AAC&U Information Literacy VALUE rubric⁴ to score that product. AAC&U recommends that institutions modify the VALUE rubrics to meet their institutional needs. UNCW has edited the information literacy rubric over the years to best fit with UNCW’s curriculum. Changes to the rubric have focused primarily on adjusting language in the various rubric dimensions.

Results
Results for information literacy for spring 2013 indicate that UNCW students have an area of relative strength in using information effectively. An area of relative weakness for an upper-division course was accessing information, in that students did not demonstrate the ability to refine their search. Although a larger percent of work samples from a 300-level course were scored “2” or above compared to a 100-level course, for all but one dimension of the rubric, the percent of work samples scored “3” or above was lower. No assignment pushed students to demonstrate more sophisticated information literacy skills. Additionally, some work was group work, so no analysis was done regarding demographics or credit hours completed. Historically, the ability to evaluate information and sources critically has been scored the lowest, and, while it was scored low in the upper-division course, it was average in the lower-division course, where one of the sets of instructions specifically included a request to study the rubric.

Assessing the Assessment
Assessing the assessment process is as important as the final scores given by faculty scorers. Throughout the years the assessment training and scoring sessions have been tweaked. The process requires continual feedback, and the VALUE rubric must be tweaked. Faculty scorers have indicated that the assignments themselves need “work” and that many information literacy assignments do not elicit the various dimensions of the information literacy VALUE rubric. Faculty scorers have mentioned that not having access to original sources cited by students in their essays or papers is problematic. Comments have indicated that it is difficult to know if the information was used in ways true to the original context or had been paraphrased correctly. Additionally, because faculty scorers are selected from across campus and not strictly from the department from which the student work was collected, scorers found it difficult to distinguish between common knowledge and ideas requiring attribution and that lack of knowledge in the discipline made it impossible to determine fully the extent of information needed.

Closing the Loop
The university has started a UNCW Learning Goals series through the Center for Teaching Excellence to begin conversations about each learning goal. The information literacy assessment results have been shared with the assessment directors for each college and school, the library faculty, and with the committee overseeing the University Studies curriculum. It is also readily available to all faculty on the UNCW website.⁵ Based on accumulated assessment evidence on the need to provide early opportunities for critical thinking and information literacy skills, the First Year Seminar has been
increased from two to three credit hours in order to provide students with a foundation in the language of critical thinking and more time learning about thoughtful use of sources.

**Future Work**
This assessment process will continue, and communication between the director of general education assessment and librarians is expected to continue. Librarians are expected to continue to serve as information literacy experts in the assessment process. Once a mass of assessment data can show trends, it is likely that University Studies courses and perhaps the curriculum itself may need to be tweaked.

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**Notes**
Discovering the Pattern, Discerning the Potential: The Role of the Library in Unraveling the Cat’s Cradle of Activity Data

David Kay
Sero Consulting, United Kingdom

1—Introduction
There is an interesting tension between collecting activity data independently of the particular analyses to which it might contribute and, alternatively, adopting a rigidly directed approach to assessment and to analytics in particular.

This keynote will suggest that clarity of purpose is fundamental to stepping out beyond the traditional management dashboard to explore the broader opportunities afforded by activity data and the stories it might have to tell.

We will consider data strategies that can enable the library to reap maximum value from its data, both for its patrons and for the institution. We will identify potential data sources within the library, elsewhere in the institution and beyond and consider how it could be connected together and at what level it should be stored and retained.

However, by way of a health warning, this is approached from the perspective of a data analyst as opposed to a qualified library assessment practitioner, and is based predominantly on insights from working with UK Higher Education libraries, starting with the first Jisc foray into “activity data” in 2009 in the TILE project.¹

Whilst many UK universities have been partners in the journey led by Jisc, particular mention should go to Manchester (2011 Activity Data project lead), Westminster (2013 LMS Change project lead) and not least Huddersfield, always UK library analytics trailblazers. Finally, a North American perspective has hopefully been assimilated thanks to inputs from Apereo and Kuali Foundation partners and insights gained though the GOKb knowledgebase project.

2—New world disorder
Out there
Data analysis in the second decade of the 21st century has been overshadowed by challenges of big data and the associated implications for analytics in terms of technology and skills. This has been evidenced and interpreted through a variety of channels:

• In 2010, The Economist published its “Special report on managing information: Data, Data Everywhere.”
• For the first time, in 2012, analytics featured in the “Top 10 Issues” highlighted annually for EDUCAUSE by IT leaders in US colleges and higher education (www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume47/TopTenITIssues2012/250724).
• Meanwhile, in the UK, a wide range of HE institutions and shared services have identified business benefits in analytics and activity data through project work in the Jisc Activity Data, Business Intelligence and Customer Relationship Management program.

Is this just another IT fad, driven by highly capitalized adventurers and global purveyors of online shopping and social media? Are the dark arts of analytics and the associated exploitation of...
personal data best left to the commercial world and to the marketing arms of our institutions? Or is there something here that uniquely addresses real operational and strategic issues in the increasingly performance-driven and customer-focused business of higher education? And if so, do we have the necessary data to hand?

It is arguable that this is nothing new, that researchers, marketers, insurers and spies have been deeply engaged with these possibilities since the onset of computing on the digits of two hands. However several things have changed since the turn of the century:

• The impact of Amazon and the likes on public awareness of recommender services
• Consumer attitudes to the exploitation of multi-sourced data arising from loyalty cards and social networking
• The visibility of large scale transactional, personal and environmental data at play in the operation of almost any consumer service, ranging from supermarkets to healthcare
• The role of the Internet, of declining hardware costs and subsequently of the cloud in enabling increasingly real time computation
• Developments in underlying math and software tools enabling computation, indexing and retrieval involving massively distributed data sets

An era of austerity has been a catalyst, but the opportunities presented by analytics are equally of interest “come rain come shine”—whether relating to economies and efficiencies in a downturn or ability to compete and differentiate in growth markets. Furthermore, groundbreaking opportunities converge with new social norms as consumers and investors alike revise their expectations of how the businesses and services should operate in web world.

Inside Higher Education
Louis Soares (director of the postsecondary education program at The Center for American Progress) highlighted these conditions in his March 2012 EDUCAUSE Live presentation on the importance of analytics in Higher Education, emphasizing the tie up between analytics and the imperatives of:

• Cost
• Quality
• Knowing the customer

• Consumer agency

In 2012–13 CETIS, the UK centre for educational technology at the University of Bolton, published a series of five reports illustrating the breadth and relevance of the analytics agenda in higher education:

• Whole Institutional Issues
• Ethical and Legal Issues
• Learning and Teaching
• Research Management
• Technology and Infrastructure

This heightened debate has been particularly evident in the pursuit of learning analytics, with its ultimate focus on student retention and success and how that might be supported in near real time through the monitoring and understanding of vital signs, what Purdue has called “Course Signals.”

The research community and its corporate manifestations are also alive to the potential of how wider and deeper data accumulation can fuel researcher success and researcher reputation and measures thereof. Altmetrics is gaining traction as an alternative to traditional journal impact factor and personal citation indices, based on the vision expressed in “Altmetrics: A Manifesto” in 2010: “These new forms reflect and transmit scholarly impact: that dog-eared (but uncited) article that used to live on a shelf now lives in Mendeley, CiteULike, or Zotero—where we can see and count it. That hallway conversation about a recent finding has moved to blogs and social networks—now, we can listen in. The local genomics dataset has moved to an online repository—now, we can track it. This diverse group of activities forms a composite trace of impact far richer than any available before.”

Within the Library
Meanwhile it might be argued that the library analytics world remains closed in terms of both vision and data, notwithstanding its considerable appetite for alternative assessment models enabled by surveys and dialogue. Thanks in large part to the controlling forces of systems vendors, as well as concern for reason, reputation and rights, library analytics have remained

• fuelled by library and library community data;
• focused on processes—such as collection management; and
• constrained by application silos—such as ILS or the gate system.
At least that is the impression conveyed by the typical ILS management dashboard, even in the acclaimed new generation library service platforms. It is also the impression given of library analytics standing in the 2012 ECAR (the EDUCAUSE Center for Applied Research) survey of member institutions.

In that respect, as a backdrop to considering the position of the library and its data in the wider ecosystem, the model developed by Jisc’s 2013 LMS Change project is of interest. This illustrates how the library platform needs to be understood in the context of four powerful and independently mediated classes of services:

- On the horizontal dimension, other services operated by institutions, such as registry, course management and finance
- Vertical library community services, operated above campus
- Global services, typically in the web space, ranging from search engines to social media and identity management
- Not least, what the patron, as teacher, learner or researcher, brings from their own world
3—Core Questions
So we observe that there is an exciting yet threatening intensification of the intelligence potentially available to businesses and institutions arising from digitally mediated interactions—in terms of volume ("big data"), variety (multiple connectable sources) and velocity (frequency of capture). However, the scale of this opportunity challenges our ability to accumulate (store), to analyse (process) and to assimilate (present) using traditional means.
Doug Chow’s diagram further illustrates the challenges of velocity and volume in terms of the response expected by different audiences:

In 2012, the Jisc “Data Deluge” paper observed that “central to the mission and everyday business of post-compulsory education, there is clear potential for analytics in enabling managers to derive and act upon pre-emptive indicators and ‘actionable insights’ gained from activity data and associated analytics.” The paper proposed that it is essential to determine how this potential and its challenges can be addressed not only to benefit higher education business operations but also to deliver the sort of personalized and responsive user experience that has become an expectation of online citizens.

It is however important for our response to be grounded in the business of the institution and of the business unit, avoiding the temptation to focus on IT infrastructure as a means to get going with analytics. While tools are necessary, they are available in abundance and therefore represent a second order problem. The starting point is to ask questions about how analytics can meaningfully improve efficiency or effectiveness.

To focus our attention, consider three areas of practical impact, from a library service perspective:

- **Area 1**: Assessing performance—in pursuit of efficiencies, economies and effectiveness, optimizing alignment of enterprise resources with mission and customer interests
- **Area 2**: Informing audience segmentation—leading to targeted interventions to support students, researchers and staff
- **Area 3**: Identifying trends—assessing service opportunities and business models across the teaching, learning and research landscape, the publication, discovery and access lifecycle

However, before we get in to the specific requirements, the principal concern of this paper is to achieve clarity on some underlying issues

1. What?
2. Where?
3. How?
4. Why?
5. When?

We shall refer to the three areas set out above as we consider these questions.

**Question 1—What data should we collect?**

We have two conflicting options:

- To collect whatever data we can and let it tell its story
- To collect data specific to areas of interest or known to be useful

Perhaps there is a third option that should be discounted in the context of this paper—that is to rely on our transaction systems to determine our capability by collecting their chosen data.
If we choose the more expansive approach we should note the underlying and escalating challenge of scale—the Analysis Gap described above. However there is a compelling argument in favor of this approach if analytics are to contribute to our service design taking account of known audiences (Area 2 above) and emerging trends (Area 3).

Clearly there is a judgment to be made about which events are significant—as the celebrated historian E.H. Carr argued, not every cake burning represents history in any useful sense. In 2011 we developed the [www.activitydata.org](http://www.activitydata.org) website to address this and similar questions.7

Tony Hirst, well known in the UK for his work at the Open University and more widely in the analytics field, has been a persistent advocate for the belief that data has stories to tell. His July 2014 blog post on a conversation with the data in Isle of Wight parking meter transaction logs exemplifies his way of thinking.8

**Question 2—Where might that data come from?**

There are four broad patterns for sourcing and mixing data:

- Work within the library service platform (ILS)
- Work across the range of library systems and instruments
- The library wishes to combine with external data
- External units wish to combine with library data

Traditionally systems-based library assessment activity may have been based on the knowledge available within the ILS, potentially combined with data from other transaction sources within the library domain, such as gate information covering physical access and COUNTER stats from e-resource publishers.

However, for each of the three areas of analytics focus introduced above, there is a high likelihood that the necessary data will come from a range of systems. This will range from additional category information relating to patrons (perhaps from registry, course management, research or HR systems) to further transaction data enriching patterns of activity (such as assignment submission and grading).

The underlying challenge is how to weave that data together, a task deeply dependent on compatibility of identifiers (IDs for people and also for business objects such as organization units and courses). As emphasized by Ted Dodds in Jisc’s 2012 Cornell case study,9 the essential foundation of analytics is to identify systems and data elements of record, which requires authority and effort at a corporate...
level if it is to work without repeated pain year on year.

In the same report, Joe Zucca of the University of Pennsylvania emphasized the importance of authoritative IDs as exemplified in Penn’s MetriDoc development, which can reach out to authoritative sources to transform digital object identifiers into citation elements or exchange user IDs for demographic markers.

In a further example, the work of the library at the University of Huddersfield on early warning indicators in the Impact Data Project strongly illustrates the importance and value of synchronizing IDs, enabling atomic student level course and library activity data to be analyzed together. The data indicated that if you do not use the library as an undergraduate, you are over seven times more likely to drop out of your degree (7.19 to be precise). Whilst there is no suggestion of direct cause and effect, there is a highly actionable “early warning” opportunity.
So, specifically, who has what data? For each of the following examples of data sources, libraries should ask:

- Whether they need it
- Whether it is the canonical source
- Whether they can access it
- Whether the data is of sufficient quality to be fit for purpose
- Whether the data is the right level
- Whether it contains identifiers that enable integration with other sources

<table>
<thead>
<tr>
<th>Library systems</th>
<th>Course Management systems, including LMS &amp; MOOCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Circulation activity</td>
<td>• Teaching Units</td>
</tr>
<tr>
<td>• Subscribed e-resource activity</td>
<td>• Recommended reading</td>
</tr>
<tr>
<td>– through such as COUNTER, EZproxy</td>
<td>• Submissions/Assessments</td>
</tr>
<tr>
<td>• Institutional Repository access</td>
<td>• Resource access</td>
</tr>
<tr>
<td>• Discovery tool logs</td>
<td>• Participation such as posts</td>
</tr>
<tr>
<td>• Gate/access system logs</td>
<td>• Performance Monitoring/Early Warnings</td>
</tr>
<tr>
<td>• Customer Services, including help desk and online</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Corporate systems</th>
<th>Research systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>• People</td>
<td>• Funder/Grant References</td>
</tr>
<tr>
<td>• Organization units</td>
<td>• Publications</td>
</tr>
<tr>
<td>• Courses</td>
<td>• Licensing</td>
</tr>
<tr>
<td>• Results/Awards</td>
<td>• Research data</td>
</tr>
<tr>
<td>• Expenditure</td>
<td>• Social altmetrics</td>
</tr>
<tr>
<td>• Website analytics</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Above Campus community services</th>
<th>Out there</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Knowledge Bases, including CUFTS, DOAB, DOAJ, GOKb</td>
<td>• Government</td>
</tr>
<tr>
<td>• ID services, including ORCID, ISNI</td>
<td>• Agencies and Regulators</td>
</tr>
<tr>
<td></td>
<td>• Social tagging and citation on the web, via such as Mention and Topsy</td>
</tr>
<tr>
<td></td>
<td>• Research and Reference Tools such as CiteULike, Mendeley, RefME or Zotero</td>
</tr>
</tbody>
</table>

**Question 3—How will we store it?**

The options range between two poles:

- Aggregate transaction data under agreed business headings
- Store core transaction events

These options represent the fundamental tension introduced in Question 1, between building the capacity to address local known problems and cultivating the capability to pursue wider, potentially open-ended enquiries.

Any data owner will be familiar with the challenges underlying each option, some of which are illustrated here:
<table>
<thead>
<tr>
<th>Challenge</th>
<th>Aggregate Events</th>
<th>Store Core Events</th>
<th>Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1—Storage &amp; Processing</td>
<td>Small and predictably slow growing</td>
<td>Large and unpredictably fast growing</td>
<td>Does scale matter anymore?</td>
</tr>
<tr>
<td>2—Security</td>
<td>Personal data and IDs not required</td>
<td>Even records without IDs can be sometimes traced to individuals</td>
<td>Modern businesses mitigate such risk proactively</td>
</tr>
<tr>
<td>3—Retention</td>
<td>No requirement to retain raw data beyond its operational lifespan</td>
<td>Requires a long term retention policy (e.g., 10–15 years or even without limit)</td>
<td>Ditto</td>
</tr>
<tr>
<td>4—Combination with other datasets</td>
<td>Only remains possible if they are at the same or higher levels of aggregation</td>
<td>Maximizes the potential subject to compatible IDs at transaction level</td>
<td>This is a significant impediment</td>
</tr>
<tr>
<td>5—Flexibility to address questions</td>
<td>Does what it says on the tin</td>
<td>Offers flexibility at the level of time stamp, the individual and the business object</td>
<td>Ditto</td>
</tr>
</tbody>
</table>

In terms of resource utilization consider the questions you can and cannot answer if you aggregate analytical datasets at different levels:

- Timestamp
  - Date Range
- Transaction
  - Transaction Type
- Resource
  - Resource Type
- Person
  - Person Characteristic

For example, imagine aggregation of activities or transactions on the basis of highlighted here:

- Timestamp
  - Date Range—e.g., August 2014
- Transaction
  - Transaction Type—e.g., Loan
- Resource
  - Resource Type—Monograph
- Person

- **Person Characteristic—Year 1 Full Time Student**

Consider whether such aggregated data could support explorations such as:

- Resource utilization levels of particular student types on art history courses
- Take up of resources purchased/subscribed by the economics faculty across other disciplines
- Comparative patterns of resource utilization for students graduating with distinction over the past five years
- Incidence of help desk enquiries at different times of day across the academic year

As Marcum and Schonfeld observe in their 2014 Ithaka S+R “Driving with Data” briefing, the nature of COUNTER statistics exemplifies the shortcomings of aggregation: “Activity counts, even when applied to collections, can no longer be accepted as telling the whole story. For example,
usage data that are aggregated at the COUNTER-compliant level do not show breakdowns by traffic source, which is vital for understanding discovery patterns, or by user type, which would allow libraries to distinguish teaching from research uses.”

Question 4—Why are we doing this?
We are now in a position to consider some specific motivations.

In the UK, the Jisc LAMP project wanted to understand exactly this, so in 2013 we interviewed collections and service managers to identify user stories—simply aspirations about what libraries want to do with analytics data and why. We gathered 96 stories and then took a vote on importance in which a total of 49 stories gained over one third of the maximum points from 11 voting libraries.

Of these, 19 stories might be classified as “epic” or “mission” stories, indicating the management and strategic purposes that analytics need to serve:

<table>
<thead>
<tr>
<th>Cat</th>
<th>AN - to inform collection management policy</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Col1</td>
<td>K - to inform dialogue with faculties</td>
<td>17</td>
</tr>
<tr>
<td>Col1</td>
<td>M - to deliver better / best value for money</td>
<td>14</td>
</tr>
<tr>
<td>Mission</td>
<td>D - to impact student measures of satisfaction, such as NSS</td>
<td>13</td>
</tr>
<tr>
<td>Col1</td>
<td>L - to promote evidence led intelligent decision making</td>
<td>13</td>
</tr>
<tr>
<td>T&amp;L</td>
<td>AA - to develop indicators regarding success / progression / retention</td>
<td>13</td>
</tr>
<tr>
<td>Mission</td>
<td>C - to demonstrate value added to users</td>
<td>12</td>
</tr>
<tr>
<td>Service</td>
<td>V - to target skills development (knowledge)</td>
<td>12</td>
</tr>
<tr>
<td>T&amp;L</td>
<td>AB - to target and assess academic skills interventions</td>
<td>12</td>
</tr>
<tr>
<td>Mission</td>
<td>A - to connect the library with the university mission</td>
<td>11</td>
</tr>
<tr>
<td>Mission</td>
<td>F - to inform / justify library policy and decisions as evidence led</td>
<td>11</td>
</tr>
<tr>
<td>Mission</td>
<td>G - to engage stakeholders in productive dialogue</td>
<td>11</td>
</tr>
<tr>
<td>Service</td>
<td>Y - to understand access patterns through such as portals, discovery layer</td>
<td>11</td>
</tr>
<tr>
<td>Service</td>
<td>Z - to validate service developments and implementations</td>
<td>10</td>
</tr>
<tr>
<td>T&amp;L</td>
<td>AS - to deliver support and skills interventions at the point of need</td>
<td>9</td>
</tr>
<tr>
<td>T&amp;L</td>
<td>AD - to position library teaching effort</td>
<td>9</td>
</tr>
<tr>
<td>Recom</td>
<td>AE - to improve resource selection</td>
<td>9</td>
</tr>
<tr>
<td>Service</td>
<td>X - to identify combinations of factors linked to dissatisfaction</td>
<td>8</td>
</tr>
<tr>
<td>T&amp;L</td>
<td>AQ - to track the learner journeys</td>
<td>8</td>
</tr>
</tbody>
</table>

The remaining 30 might be classified as “activity” stories, indicating more detailed things that librarians want to do with analytics:
Categories
Each statement was categorised in terms of its broad intent:

- Mission—High level “mission” statements that are “epic” user stories
- Data—Stories about the range of data available for analysis
- Collection—Use of analytics for collection management
- Service—Use of analytics for service improvement, including enquiries
- Teaching and Learning—Use of analytics to enhance the learning experience and student success
- Recommendation—Use of analytics to provide recommender services

Mission Stories
The principal focus of the “mission” stories was collection management (see Story AN) and its contribution to value (Story M), satisfaction (Story D) and impact (Story C).

There was also strong recognition of analytics as a tool in:
- Supporting dialogue with faculty (Story K)
- Evidencing and positioning library business cases (A, F)
- Proactively enabling support activity such as patron skills development to be better designed and targeted (V, AB, AS, AD)

Activity Stories
The challenge for libraries and for systems providers is to identify what data is required to support these requirements and how it might feasibly be collected within and across systems.
- The focus on e-resources emphasises this challenge in two of the top three activity stories (Story 38, 4, also 19)—especially linking
e-resource activity to users just as we are accustomed to doing with print.

- There is persistent recognition that insightful analytics need to combine data from more than just a single vendor system (2, 29, 32, 1).
- More firmly within grasp is the use of analytics to respond more effectively to differentiations in terms of faculty (14, 9) and user demographics (33).
- Analytics relating to enquiry management and related service improvement is regarded as an important dimension (29, 48, 54).
- Whilst clearly recognised as an opportunity (61, 62, 34), there is less emphasis on using analytics for recommendation, surfacing reading options for users as popularised by companies such as Amazon.
- Last but not least, we should not underestimate that presentation is a critical part of the challenge (8, 9).

**User Stories Revisited**

One year on, in July 2014, the LAMP project library representative revisited their views of key analytics priorities. At the same time the group reflected on the extent to which transaction data at item (e.g., atomic circulation transaction or service enquiry) or people (e.g., my loan, my enquiry) is required by the particular analytics objective.

<table>
<thead>
<tr>
<th>Analytics Needs to inform</th>
<th>July 2014 Rank</th>
<th>Needs Item Data</th>
<th>Needs Person Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Success</td>
<td>1st</td>
<td>Poss</td>
<td>Yes</td>
</tr>
<tr>
<td>Dialogue with faculty</td>
<td>2nd</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Service Improvement</td>
<td>3rd</td>
<td>Poss</td>
<td>Poss</td>
</tr>
<tr>
<td>Benchmarking</td>
<td>4th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional analytics</td>
<td>4th</td>
<td></td>
<td>Poss</td>
</tr>
<tr>
<td>Investment management</td>
<td>6th</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Space &amp; stock management</td>
<td>6th</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Exploration of the unknown</td>
<td>6th</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Personalised recommendation</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>User skills programmes</td>
<td></td>
<td>Poss</td>
<td></td>
</tr>
<tr>
<td>Author impact</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collection balance (E v. P)</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Business case development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision making culture</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Question 5—When should we start?**

Varying management styles and organizational imperatives will suggest different responses:

- When we have decided on the library’s priorities/the strategic questions to be addressed/etc.
- When the institution has established its overall analytics framework
- Just do it...now!

However, whatever your responses to our other core questions, there is a compelling argument that “now” is the only tenable answer in this case, that activity data should be accumulated from every capable operational system and that any new systems procurements should mandate the collection of reusable atomic activity data (that is, for free for use by the library outside the collecting system). It is imperative to start now because:

- Critical mass of evidence involves accumulation over multiple academic years
- Libraries are hamstrung by adopting non-compliant vendor systems for relatively long periods
Not least, growing expectation in terms of user experience and business practice does not favor procrastination.

The experience of the University of Huddersfield is instructive. The library accumulated around 3.9 million circulation transactions over 15 years before identifying in 2009 what could be done with this wealth of data.

The synthesis report on Jisc’s activity data program (2011) highlighted that the findings of the projects “indicate that service directors should prioritize identification, collection and preservation of such data.

• Activate collection—Data collection capabilities should be activated for existing systems;
• Include in system requirements—New implementations should include a requirement for accessible activity data logging;
• Harvest across systems—Connections between activity data sources are a key consideration;
• Acquire skills—Key skills need to be developed in new types of storage, analysis and visualization.”

Indeed, the cultural journey of developing a business analytics capability is perhaps the most compelling reason for doing it right now. As Marcum and Schonfeld point out, “the challenge is not only to create the technical structures that allow data gathered for one purpose to be made available to the rest of the staff for other uses, but also for the organizational structure and culture to make it important that staff do so.”

4 – Concluding Remarks
It seems reasonable to conclude that the vast majority of academic libraries do not have the capacity (i.e., deployable skilled resources) to pursue all the opportunities outlined here. However directors should be minded that much of what has been discussed is widely regarded as essential business and customer service practice.

Universities in general and libraries in particular do have data to die for. Consequently there are low cost actions that can open up constructive opportunity in terms of the development of practice and early tactical gains as well as strategic dialogue within the service and more widely in the institution.

• Establish policy so there is a clear code of practice and framework for development without legal impediment.
• Take an incremental approach by balancing strategic development with achievable tactical projects; in so doing ensure that data is accumulated for the long term rather than treated as a passing project artifact.
• Build collaborative relationships with like-minded stakeholders at all levels—faculty, students union, institutional leaders—who will value your proactive commitment to evidence led research and actionable outcomes.

A final word from Jacqueline Bichsel’s 2012 Analytics in Higher Education’ report for ECAR: “Analytics programs require neither perfect data nor the perfect data culture—they can and should be initiated when an institution is ready to make the investment and the commitment.”

In this respect the library might be a welcome influencer and leader.

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Endnotes


7. “Which Events are Significant?” Exploiting Activity Data in the Academic Environment, Jisc, last updated February 11, 2011, http://www.activitydata.org/Which_events_are_significant.html#Which_events_are_significant.


Abstract
The Canadian Research Knowledge Network (CRKN), a national research library consortium, undertook an external review in 2013 to assess both negotiation effectiveness and administrative cost efficiency. In addition, the review created points of comparison with other consortia for ongoing assessment of negotiation effectiveness.

This paper discusses the challenges for a library consortium in undertaking an external review, including lack of precedent, data and methodology limitations, the diverse mandates and organizational structures that characterize library consortia, and the complex and unstructured environments in which they operate. A variety of quantitative data on consortial pricing was explored, and some useful ways to compare negotiating practices and operations of consortia are indicated. This review can assist academic library consortia seeking to assess and demonstrate value to members.

Introduction
The Canadian Research Knowledge Network (CRKN), a national academic and research library consortium, undertook an external review in 2013 in order to assess both its negotiation effectiveness and administrative cost efficiency, and to create points of comparison with other consortia for ongoing assessment of negotiation effectiveness. This paper reports on the methodology and results of this project to determine the value provided to members, by comparing CRKN’s performance with other similar academic library consortia.

CRKN is a nonprofit member organization, with a primary mandate for large-scale digital content acquisition and licensing initiatives. Since its inception in 2000, it has grown to include 75 members, all degree-granting universities and colleges. Currently it manages about 52 national licenses, with annual license expenditures of some $88 million. Being a member-driven organization, and given accountability requirements resulting from its national digital content research funding successes, CRKN has a track record of evaluations.

In this context, it is not surprising that the CRKN board of directors authorized a review to address concerns expressed by members: was CRKN negotiating the best licensing deals, and were its operations cost efficient? Some large members, because of their size, believed they might be able to broker better deals. Both small and large members were unsure whether their membership dues were good value. This review was timely, given that CRKN was in its fifteenth year of operation and had recently hired a new director.

A recent article by Faye Chadwell surveys the literature on consortial assessment and discusses the context in which academic library consortia communicate their benefits to members and the various ways in which consortia need to demonstrate value. Recent consortial efforts to assess organizational value are described in articles by Slight-Gibney et al. and Perry and Self.

For consortia with digital licensing mandates, the evaluation of big deals and other licensed resources is critical to understanding the consortial value proposal. Blecic et al. reports on a method to compare the value of big deals and of individual journals in large packages and notes that the big deal still represents savings. Bergstrom et al., in an analysis of individual library costs for large journal packages, concludes that some libraries have better pricing than can be explained by institutional characteristics and suggests that some universities or consortia have been more successful in bargaining for lower prices. Measuring the Impact of Networked Electronic Services (MINES) projects have looked at usage of resources licensed by a consortium to assess value. A more qualitative methodology developed by the California Digital Library, which uses local citation impact and usage data for reviewing the value of its licensed...
agreements, has also been piloted for member use by CRKN.

External Review Overview

The explicit goals of the CRKN review were to:

1. Assess CRKN’s negotiating efficiency and resulting benefits to members
2. Create guidelines for ongoing success in negotiating effectively
3. Assess CRKN’s administrative efficiency
4. Provide a final report with recommendations to the board of directors

The review, which the CRKN board of directors decided should be modeled on an academic external review, using a comparative approach, was undertaken March 2013–January 2014. Given the differing goals and the consortial setting, the review necessarily proceeded quite differently than a standard academic review. The board identified two external reviewers from similar consortia, and a consultant was engaged for data collection and analysis. The importance of maintaining confidentiality for both participants and license agreements was an important consideration throughout.

A review of the consortia in the International Coalition of Library Consortia (ICOLC) directory affirmed the popular notion that consortia are as unique as snowflakes and identified a small number of consortia similar in scope and size to CRKN. ICOLC members were considered as to mandate, operations, support, and function, as well as type, number, and size of members. Six consortia, similar to CRKN, in being large, well established, with a research or academic library focus, a national profile, and a mandate or emphasis on licensing activities, agreed to participate. These participants provided organizational information, copies of license contracts as possible, and participated in interviews and questionnaires about negotiating aims and practices.

To ensure consistent and comparable data to assess negotiating efficiency, three agreements, licensed by all participating consortia for more than five years, with relatively stable content (no publisher amalgamations, for example), were selected for the review.

Goal 1. Assessment of Negotiating Efficiency

Put simply, goal 1 of the review was to determine if CRKN got a good deal for its members. What measures could identify differences among consortial deals, and assess CRKN’s ability to provide value to members? Four possibilities were investigated—

1. annual percentage increases over a period of years;
2. cost per use;
3. cost per FTE; and
4. costs paid by individual libraries, requested by CRKN members.

Despite the willingness of the participating consortia to share information, given confidentiality assurances, not all the data requested could be obtained. Some consortia did not have complete annual agreement costs because invoicing was done directly between vendor and library. Information about older agreements was not always available.

Comparing Cost Data of Consortial Agreements

Teasing out the variables that affect agreement costs was important to provide context for cost differences that might be identified. In the literature, big deals are generally treated as monolithic, but a close look at agreements for what might be titularly the same product, reveals variations that influence pricing. These include:

- Length of the agreement term
- Number of titles included
- Start date for journal titles
- Terms for adding new and transfer titles
- Currency differences (USD, GBP, EUR)
- Original (pre-agreement) costs paid by participating libraries, often based upon print holdings
- Size and types of participants: library branches, major library systems, etc.
- Variable pricing terms such as discounts for early signing or payment, or alternative agreements for a subset of members
- Environmental, financial and historical contexts of individual consortia

Terms for including new or transfer titles were particularly important, since annual percentage increases might not include these costs. Some
consortial agreements were for fixed list packages, and libraries paid for other titles outside the consortium agreement. Transfer titles are those that have moved from other publishers, and terms vary as to whether these costs are rolled into an agreement.

In Chart 1 below, annual percentage price increases over seven years have been averaged to show the differences in consortial license agreements. For agreement 1, the lowest average annual percentage increase was just over 3%; the highest was 6%. These averages conceal considerable variations—for example, an average annual increase of 4% for one agreement ranged from 0% to 7%. Although CRKN tended to be among the lowest, a different consortium had the highest and lowest average increase for each agreement.

**Chart 1. Average Percentage Price Increases, 2007–13**

![Chart 1](image)

*(Using 4 consortia for agreement 1; 5 consortia for agreements 2 and 3.)*

Chart 2 summarizes consortial license prices using cost per use data for one year (2012). Although this data further illustrates pricing differences among consortia, not all consortia collect consortial level usage data, and not enough could be obtained to make valid comparisons.
Chart 2. Cost per Use (2012)

Analysis of cost per FTE data confirmed that national differences in higher education and differing definitions of FTE obscure its usefulness for consortial comparison.

It was not possible to compare costs paid by individual libraries, as requested by some CRKN members. The national characteristics of higher education make the determination of peer or comparable institutions in an international context difficult. After a review of international university ranking systems and library benchmarks, ARL statistics were used to identify a cluster of Canadian and American libraries, but the analysis of individual licensing costs for this cluster only highlighted the difficulties of identifying peer institutions and understanding license cost variations.

Findings: Assessing Negotiating Efficiency
Annual percentage increases over a period of years were determined to be the most reliable measure for consortial comparison of licensing effectiveness. Given the number of contract variables that can affect pricing, tracking performance over a number of years and renewal cycles was important. For this survey, seven years of percentage increases were as much as could be obtained.

An agreement that seemed favorable (when annual percentage increases and cost per FTE were used as measures) appeared less favorable when cost per use was applied. This suggests that the cost comparison measure must be carefully chosen to reflect the intent of the research. As noted earlier, cost data comparisons of license agreements are made difficult by
- variable pricing practices of scholarly journal publishers;
- historic pricing base of most journal packages;
- international context of consortial licensing; and
- agreement variability.

Non-monetary license terms seemed not to be a factor in cost outcomes of consortial agreements. For example, CRKN is unique in negotiating local loading or hosting in the majority of its agreements, and there was no indication that this inclusion had influenced agreement pricing.

Goal 2. Guidelines for Negotiations
The second goal of the CRKN external review, determining guidelines for ongoing negotiations, was to be addressed by
- creating points of comparison with other consortia for ongoing success in negotiating effectively;
• recommending ways to incorporate self-assessment into negotiation activities; and
• reviewing "significant and fair discount from the vendor's standard institutional price."

Through written and telephone interviews, consortial contacts were polled about negotiation priorities, policies, and practices. This information was organized in the following categories:
• Managing negotiation priorities, including member involvement
• Self-assessment
• Discounting goals

For most consortia, the primary negotiation priority was getting the best deal for members, and negotiations were directed pragmatically towards that end, without direct member consultation on the part of most consortia. This priority was generally expressed in non-specific terms such as achieving financial and administrative savings or favorable terms of usage.

Pricing models were important negotiating priorities for a few consortia attempting to move away from historic print spend models. These consortia used institutional information, such as FTE or other member characteristics, in working with vendors to develop mutually acceptable pricing alternatives. Predictability in pricing and appropriate pricing models for different product types were also mentioned. Most consortia, committed to ensuring that all members could participate, also aimed for tier pricing or "a price to play" so that the smallest members could join agreements.

Consortial negotiation priorities were driven by consortial mandates and the goal of ensuring member participation. A consortium with a collection-sharing mandate emphasized strong interlibrary loan terms and considered this priority as important as cost savings. Flexible terms to increase member options for participation were seen as an important service to support member participation in another large and diverse consortium. Model licenses served as standard reference points in consortial negotiations, even when not used for actual contract signing. The inclusion of new terms to accommodate needs for data mining or alumni access tended to appear in different consortial licenses at the beginning of license cycles, as consortial pressure for these rights changed industry standards. Tracking the inclusion of such license terms demonstrated that consortia have been leaders in improving industry licensing standards.

Most consortia did not engage in self-assessment of negotiation effectiveness. One or two developed specific negotiation aims for both pricing and non-monetary goals and then reported back to members formally on how these had been achieved. In most consortia, cost-saving balance sheets for individual agreements, using publisher or list pricing, were typically provided to members to demonstrate effective negotiations. Other aspects such as staff savings realized through centralized negotiations were not generally reported.

CRKN guidelines for license negotiations developed in 2009 included the notion of "a significant and fair discount from the vendor's standard institutional price," and participating consortia were asked for their interpretation of this objective.

While obtaining a discount was the aim of consortial negotiations, the amount of that discount was contextual. Consortia suggested that reasonable annual price increases might be less than the consumer price index, less than 5%, or single-digit increases. Discount expectations also varied by type of material. Vendor price lists, even though these are understood to be largely hypothetical constructs in a consortial context, were used as the base for calculating consortial discount savings.

Consortia agreed that all members should receive a discount benefit at least equal to, and preferably greater than, what could be negotiated individually. Even though members might not all receive the same discount, this principle affirmed the value of all members being able to participate.

In summary, most consortial negotiations were undertaken in a dynamic, license-specific context, in which vendor offers were generally the baseline for price negotiations. Negotiation priorities included cost savings as well as licensing objectives, but since the aim was always to arrive at the best offer for members, the priorities were seldom seen as absolutes. Consortia generally have not developed self-assessment practices, and continuing member participation in
agreements is most often taken as the indicator of negotiating success.

**Goal 3. Assessing Consortial Efficiency**

The third goal of the external review was to assess CRKN’s operating efficiency against other consortia by a calculation of licensing costs compared to operating costs. However, since most participating consortia were supported or funded by external units or organizations, total operating costs were not available. Besides CRKN, one other consortium was able to provide total operating costs; in both cases the ratio of operations expenses to license expenditures was less than 2%.

In any event, substantial differences in consortial mandates and resulting activities would have challenged the validity of this comparison. Instead the external review documented the purposes and operations of the participating consortia, the range of licensing support activities, and member communications and involvement in order to make a comparative assessment of organizational efficiency.

**Diverse Organizations**

The following categories were used to describe the purposes and operations of consortia:

- **Type**: non-profit membership organization, government body, unit or program within an organization or library
- **Mandate and scope of activities**: licensing, resource sharing, digital collections, advocacy, statistics, services for members, etc.
- **Operations funding source**: membership, government, or host organization
- **Number of members**: 10 to over 400
- **Staffing levels**: 2–11 staff involved in licensing
- **Staff and operations costs**: as available
- **License funding sources**: members only, grants, other
- **Number of licenses, and licensing costs**: 40–450 agreements; $37m–$118m
- **Total FTE of members**: .25m–2m FTE

As the ranges in these categories indicate, there were tremendous differences in the scope of activities. Mandates and funding sources were the most important drivers of the diversity of operations. Unlike CRKN, most of the consortia polled had licensing as only one element of their mandates and activities.

**Licensing Support and Lean Operations**

Significant variations in consortial management of licensing-related tasks and in member services supporting licensed resources were noted. Involvement of volunteers and committee oversight in these activities also varied. Invoicing practices varied: invoicing might be entirely handled by the consortial office or shared with the member libraries or vendors. Some consortia, because of member requests, had negotiated the ability for members to use vendors for payments. IP address or link resolver database maintenance, access troubleshooting, help desks, and provision of statistics were other services that might be supported, to greatly varying degrees, by the consortia surveyed.

Consortia were lean operations, and consortial contacts spoke of the challenges of finding operational efficiencies in order to manage an increasing number of licenses with the same staffing. Staffing levels were reflective of organizational mandates and funding and determined the range and intensity of member support activities. Most consortia had not documented the operating efficiencies that their work offered to members.

**Member Communications and Involvement in Licensing**

Consortial staff mostly handled negotiations, and members were represented through oversight committees. Member polling to determine negotiating objectives was not usually a formal process. Consortia were responsive to members and aware of the need for accountability, but few reported formally about negotiation criteria or outcomes. Within the constraints of staffing levels, members were involved through annual meetings, committees, listservs, and other means of communication.

The sheer diversity of consortial operations challenged attempts to make organizational comparisons for this review. Differences in consortial operations are based upon, but not always explained, by the scope of consortial mandates and funding sources. The external reviewers particularly noted the importance of balancing accountability to members and operating efficiencies. For example, the high level of member communication and involvement at CRKN befits its origins but is a cost to the organization.
and may result in other priorities not being addressed. Consortia members need to be engaged in determining the balance between member communications and efficiency of negotiating and licensing operations.

Utility of Review Measures
Employing quantitative measures for comparing consortial license costs and largely qualitative evidence for organizational assessment, this review revealed the complexity and challenges in determining appropriate measures for the assessment of consortial value.

Cost Data of Consortial Deals
Tracking average percentage price increases, provided this is done through several license renewal phases, is an appropriate means of assessing consortial performance. In a small sample, considering the effect of different license terms, such as treatment of new titles, is critical. For the other measures attempted in this review—cost per FTE, cost per use, and individual library costs—either sufficient data could not be obtained or factors could not be controlled to ensure valid comparisons.

This review highlighted the intractable issues around explicating the costs of consortial big deals. They can seem more or less favorable depending upon the lens or measure used. Even when new pricing models may be negotiated, consortial big deals continue to reflect the historic print cost base and regional and institutional contexts rather than current content and local value. If the intent of a study were to focus on consortial licensing performance, the use of content first acquired through consortial agreements would be a better indicator.

Consortial cost comparisons are challenging because consortial licensing operates in a context of differential pricing. List prices do not reflect actual consortial pricing, and there is no market base for evaluating cost differences. There is some irony in noting that consortial activity may be encouraged in such an environment, but the determination of a fair or reasonable price is made more difficult.

Organizational Comparisons
An external review as a methodology for determining value can provide authority at all stages. External reviewers provide guidance in the process, critical contextual understanding, and authority for conclusions and recommendations. The external review process can be a powerful tool to enable a member-driven organization to assess its value for members and funders.

At the same time, a comparative approach for consortial assessment presents real challenges. The diversity of consortial operations, mandates, and their environments challenges any kind of organizational benchmarking exercise. Library consortia operate in a context where there are few absolutes and much complexity. The most relevant peers for CRKN were different enough in every dimension to make organizational comparisons difficult. The involvement of the participating consortia was critical to this review, and their generosity and support affirms the value of, and the need for, these collaborative efforts to develop better understanding of measures for consortial value.

Revealing Consortial Value
What did this review reveal about the value of the CRKN consortium, and what does it suggest about the value of library consortia in general? The external reviewers affirmed CRKN both for its negotiations and operations, while making some specific recommendations for ways to continue value assessment. In the larger context, this review asserted the value of consortia by noting the compound value of the historic savings generated from consortial discounting successes. The external reviewers also commented on the decline in average percentage price increases in recent years, affirming the role of consortia in reducing industry pricing norms in difficult budgetary times. In addition, consortia clearly have a significant role in driving industry licensing standards.

Set within the changing global context for consortia, this review suggests the need for services that respond to differing member needs and declines in funding, as well as to the opportunities offered by open access and changes in scholarly communications and higher education. Further, the value of organizational responsiveness to members was affirmed in the positive response of CRKN members to the report.

Just as important was the member learning that resulted from this process. Consortial members,
being focused on their own institutions’ needs and abilities to pay, are not necessarily aware of the context in which consortia operate, or their effectiveness. The external review created the context for a useful dialogue between member expectations and CRKN’s capabilities to manage the cost environment.

In its comparative approach, the external review shines a light on the international consortial community, which has a strong sense of identity and many common goals but is composed of organizations necessarily disparate because of operating mandates and national environments. Any benchmarking of consortial activities and operations must be anchored in these differing mandates, operating realms, and funding sources. An ambitious project in its scope and focus on comparative assessment, this review is a model for academic library consortia in demonstrating both benefits and challenges in the assessment of consortial value.

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Notes


Value of the Online Newspaper Collection at the University of Illinois at Urbana-Champaign Library

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Abstract
The university library at the University of Illinois at Urbana-Champaign licenses or owns over ten thousand current and historical electronic newspaper titles through five main vendors—EbscoHost, Gale, LexisNexis, Newsbank, and ProQuest, including the Library PressDisplay platform. This analysis collected information on utility at the title and vendor levels, as well as cost for each of the major aggregators to see how our patrons accessed vended newspaper content and evaluated metrics for measuring relative usefulness of each title and vendor.

Utility was measured through reports of full-text article requests in 2012 and 2013 and vendors were ranked on cost in FY12. Results revealed that a small number of titles drove the use for almost each of the vendors, and several vendors included a large number of titles that were never used. In addition, many of the most-used titles appear to have been part of data mining activity. The study also revealed some problems that would need to be remediated to fully compare online newspaper titles and collections, such as overlap in title lists, and other variables that should be evaluated in our factors, such as the impact of discovery and link resolver systems. Quality is difficult to measure because existing metrics like impact factor did not exist and current statistics like circulation are not useful for historical collections. The COUNTER project is publishing median usage factors which we plan on using in a future study, along with 2014 usage data and FY13 and FY14 cost data.

Introduction
The university library at the University of Illinois at Urbana-Champaign licenses or owns over ten thousand current and historical electronic newspaper titles through five main vendors—EbscoHost, Gale, LexisNexis, Newsbank, and ProQuest, including the Library PressDisplay platform. Prior to this study, the History, Philosophy and Newspaper Library had not systematically collected information about the utility of each of the sources, nor evaluated the usage in comparison with the cost of the resource. Starting in fall 2013, a usage study was begun to answer the question: how did our users access vended digitized newspaper content in 2012 and 2013? In addition, the study sought to investigate ways to use existing data to identify a reliable way to measure the value of an individual newspaper to our campus. This analysis was influenced by the work conducted at the California Digital Library by Wilson and Li to calculate scholarly journal value through the use of objective metrics, specifically the calculation of a Weighted Value Algorithm.

Newspaper information was collected on three factors: utility, cost, and quality. The next step was to develop a weighted value algorithm to score titles and databases as a tool for collection development.

Usage
Vendor-level usage
Analysis for the first metric, utility, began with obtaining usage reports, preferably COUNTER JR1 reports, from 2012 and 2013.

The following sources were included in our study:
- EbscoHost: newspaper source
- Gale: newspaper and newswire titles from Academic OneFile, Opposing Viewpoints in Context, and Biography in Context
- LexisNexis Academic: news sources
- ProQuest: newspaper, historical newspaper, and wire feed titles
- Library PressDisplay

These reports provided title-level data on successful full-text article requests, either HTML or PDF, for each month. LexisNexis does not provide COUNTER-compliant JR1 reports, so we obtained
title-level monthly usage data from the LexisNexis Usage platform. PressDisplay, which is a platform that offers full-color digital replicas for current newspapers with a 60-day backfile, does not record usage by article requests but rather by issues read, so we needed to analyze that data separately from the other databases.

From our initial data, ProQuest, Gale, and LexisNexis included significant numbers of titles that were not newspaper-related content. For these vendors, we had to filter the data by type of content—newspapers, newswires, and historical newspapers—using vendor title lists that were matched with the JR1 reports. This introduced problems when no match could be found, such as in cases where a title was no longer included in the databases and thus not represented in the title list, or because of ambiguity with categorization and naming practices in the case of LexisNexis.

LexisNexis had complex categories with gray areas between business, legal, and news titles. We also encountered a ProQuest platform change for usage data during 2012, requiring the use of reports from two platforms for that year and corresponding overlap in titles.

Our analysis of usage across each of the five main vendors indicated general trends for increased use during the months of the fall and spring semesters, as might be expected for a university (see Figure 1). However, there were also dramatic spikes in usage that corresponded with likely data mining activity for particular titles within a vendor, as will be discussed in the next section. PressDisplay, while unable to be compared directly with the other vendors, had consistently lower usage after May 2012 as compared to the beginning of that year (see Figure 2).

**Figure 1. Newspaper article requests by vendor, 2012-2013**

* This point includes data mining of a number of UK newspaper titles
** This point includes data mining of the San Jose Mercury News (CA) and San Mateo County Times (CA)
*** This point includes data mining of the Wall Street Journal, Chicago Defender, and Financial Times (London)
When analyzing the vendors individually, a small number of titles drove the use for almost each vendor (see Figure 3). EbscoHost was the main exception to this, but all of its titles had comparatively low usage. For Gale, the *New York Times* had 25 times more usage than the next title in 2012 and six times more usage in 2013. PressDisplay also had a single dominant title, the *Chicago Tribune*, which had over twice as much usage as the next title in 2012 and over three times as much in 2013. With LexisNexis, the *New York Times* and two of the aggregated sets, Major World Publications and All Full-text English News, had at least twice as much usage, or more, than other sets and titles. NewsBank and ProQuest had larger numbers of titles with significant usage, but two examples of data mining from NewsBank in 2012 particularly drove usage, and the *Wall Street Journal* and the historical *New York Times* had the top usage from ProQuest.
We also compared the number of titles that received article requests or issue views from each vendor with the approximate number of relevant titles available in the appropriate databases. ProQuest was the only vendor in which our usage data included titles with zero article requests. For the other vendors, we obtained title lists to use as a basis for the total number of titles; however, these often post-dated the usage figures, making the overall title counts in those cases an approximation. Despite these minor variations in title count, however, several conclusions emerge from the analysis of title usage (Figure 4). Overall, EbscoHost had the highest usage of titles from its database, but out of a relatively small number of titles. The percentage of titles used from Library PressDisplay was the lowest, with LexisNexis close behind. LexisNexis title counts, however, are impacted by its use of aggregated search categories in addition to individual titles. Finally, for most of the vendors, even ones that had at least a quarter of the titles used, there were a large number of titles that were never used.
Figure 4. Title usage by vendor, 2012–2013

Note: Source of data for total titles varies by vendor; some title counts post-date the year of usage, thus making the total number of titles with 0 requests an approximation.

**Title-level usage**

For the analysis of specific titles within the newspaper collections, we brought together separate data points for print and online versions of a newspaper as well as varied date ranges from ProQuest Historical titles and put them all under a single title heading. Lack of conformity in vendor naming practices, such as the use of locations in conjunction with the name in order to differentiate between papers with the same title, limited the effectiveness of using automatic matching to identify title overlaps, so this process was done manually for the most-used titles.

In addition to the data points that were brought together for the analysis, individual newspaper titles within LexisNexis are also part of aggregated sets. Examples of these aggregations include Major World Publications, Combined Newspapers, All Full-text English, and US Newspapers and Wires. Data on article views for these sets is reported as a whole and is not available based on individual titles. Thus, titles included in these sets may have had additional usage in LexisNexis through searches done within the aggregations.

One dimension of information about individual titles that is not thoroughly reflected in the usage analysis is the coverage range of each title from different vendors, which varies both between titles and across vendors. The analysis does separate ProQuest titles into ProQuest and ProQuest Historical, based on designations within the ProQuest databases, but even with this distinction there is generally an overlap in coverage. ProQuest Historical titles often include coverage from the nineteenth-century through the 1990s or 2000s. Titles that are not designated as “historical,” however, generally begin coverage in the 1980s and continue through to current dates, leading to an overlap between the two for titles that include both. In general, coverage for Gale, LexisNexis, and NewsBank titles starts in the 1980s, similar to the non-historical ProQuest titles.
Figure 5 shows the number of requests by vendor for ten of the most used newspaper titles from our analysis and indicates that many titles are provided by several different vendors. While ProQuest Historical, which is in orange, is predominantly separate in its range of coverage, and there are some variations in coverage periods as discussed above, there is still overlap within individual titles. In some cases two vendors have similar usage, likely due to different patron preferences for databases, while in other cases one vendor has much more usage than the others. These trends can be seen even after accounting for inflated numbers due to possible data mining activity (see Tables 1 and 2). With the New York Times, the library has access to current coverage through both LexisNexis and Gale, and both vendors receive substantial usage. For London’s Financial Times, however, ProQuest has greater usage than the other three vendors, Gale, LexisNexis, and NewsBank.

Analysis of the individual titles that had the most usage during 2012 and 2013 reveals the impact of data mining activity (see Figure 5). Two California newspapers, the San Jose Mercury News and the San Mateo County Times, were the top two most-requested titles in 2012, even above the New York Times and the Wall Street Journal, with almost all of that activity coming from NewsBank during a three-month period (see Table 1). The other top titles were generally more expected due to national or regional significance, such as the New York Times, the Wall Street Journal, and the Chicago Tribune. However, even in the case of consistently popular titles, there appeared to be instances of data mining when usage during specific periods far exceeded that of other months, such as with the Wall Street Journal in March 2013 (see Table 2).

Figure 5. Most-used newspaper titles
Table 1. Anomalous activity rates in most-requested titles, 2012

<table>
<thead>
<tr>
<th>Title</th>
<th>Vendor</th>
<th>Months of high activity</th>
<th>Peak requests in a single month</th>
<th>Average requests per month</th>
<th>Median requests per month</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Jose Mercury News (CA)</td>
<td>NewsBank</td>
<td>May-July 2012</td>
<td>65639</td>
<td>10743.9</td>
<td>17.5</td>
</tr>
<tr>
<td>San Mateo County Times (CA)</td>
<td>NewsBank</td>
<td>May-July 2012</td>
<td>39002</td>
<td>7229</td>
<td>85</td>
</tr>
<tr>
<td>The New York Times</td>
<td>LexisNexis</td>
<td>Feb-March 2012</td>
<td>7714</td>
<td>1471.3</td>
<td>570</td>
</tr>
<tr>
<td>PR Newswire</td>
<td>ProQuest</td>
<td>December 2012</td>
<td>5906</td>
<td>632.4</td>
<td>142</td>
</tr>
<tr>
<td>Business Wire</td>
<td>ProQuest</td>
<td>December 2012</td>
<td>5906</td>
<td>632</td>
<td>131.5</td>
</tr>
<tr>
<td>Financial Times (London)</td>
<td>NewsBank</td>
<td>March-April 2012</td>
<td>2985</td>
<td>356.2</td>
<td>17.5</td>
</tr>
<tr>
<td>The Times (London)</td>
<td>NewsBank</td>
<td>March-April 2012</td>
<td>1557</td>
<td>267.9</td>
<td>5.5</td>
</tr>
<tr>
<td>The Guardian (London)</td>
<td>NewsBank</td>
<td>March-April 2012</td>
<td>1841</td>
<td>249.8</td>
<td>8</td>
</tr>
<tr>
<td>Chicago Defender</td>
<td>ProQuest</td>
<td>May 2012</td>
<td>1782</td>
<td>154.8</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 2. Anomalous activity rates in most-requested titles, 2013

<table>
<thead>
<tr>
<th>Title</th>
<th>Vendor</th>
<th>Months of high activity</th>
<th>Peak requests in a single month</th>
<th>Average requests per month</th>
<th>Median requests per month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall Street Journal</td>
<td>ProQuest</td>
<td>March 2013</td>
<td>28767</td>
<td>6759.8</td>
<td>3779</td>
</tr>
<tr>
<td>Chicago Defender</td>
<td>ProQuest</td>
<td>March 2013</td>
<td>10796</td>
<td>1419.6</td>
<td>426.5</td>
</tr>
<tr>
<td>Financial Times (London)</td>
<td>ProQuest</td>
<td>March 2013</td>
<td>11051</td>
<td>1378.1</td>
<td>278</td>
</tr>
<tr>
<td>PR Newswire</td>
<td>ProQuest (historical)</td>
<td>March 2013</td>
<td>11051</td>
<td>1378.1</td>
<td>278</td>
</tr>
<tr>
<td>Business Wire</td>
<td>ProQuest</td>
<td>February 2013</td>
<td>2858</td>
<td>469.4</td>
<td>167</td>
</tr>
<tr>
<td>Los Angeles Sentinel</td>
<td>ProQuest</td>
<td>February 2013</td>
<td>1305</td>
<td>265</td>
<td>114.5</td>
</tr>
<tr>
<td>Sacramento Observer</td>
<td>ProQuest</td>
<td>March 2013</td>
<td>1449</td>
<td>160.4</td>
<td>4</td>
</tr>
</tbody>
</table>

As the drop in usage even across the ten titles in Figure 5 suggests, a small number of titles drove the majority of the usage from the content that we analyzed. With the substantial data mining activity in 2012, over half of the total requests came from the top five titles, and in 2013 the top five titles still commanded 45% of the total requests (see Figure 6).
Figure 6. Top 20 titles out of total requests, 2012 and 2013

* These numbers are high, as title de-duplication (both between and within vendors) was done manually for the top 20 titles and could not be accurately done automatically.
Cost
Because of the different types of purchase arrangements and packages for electronic resources, the cost data that we could obtain from acquisitions had varying degrees of correlation with the usage data that we were using for these vendors. This limited our ability to analyze cost based on usage consistently across vendors.

The Consortium of Academic and Research Libraries in Illinois (CARLI), of which the University of Illinois is a member, pays annual subscription costs for its members to EbscoHost Academic Search Complete (formerly Academic Search Premier) and Business Source Elite. As part of this arrangement, several additional EbscoHost databases, including Newspaper Source, are accessible to members at no direct cost. This access would therefore not be possible without the cost for the major databases, but we had no reliable way to determine a cost for EbscoHost Newspaper Source on its own.

Another issue occurred with databases that had mixed content—Gale, LexisNexis, and ProQuest. In order to have the cost information match with our usage data, we needed to calculate costs for the news content that we had filtered from the full database title lists during the usage analysis. The approach that we took was to calculate the percentage of titles with full-text availability categorized as newspapers and newswires out of the total number of titles in a database with full-text availability. We then applied this percentage to the cost of the database to determine a rough calculation. In the cases of Gale and LexisNexis, the limited number of databases analyzed made the percentage approach fairly straightforward. However, variations in the amount of content between titles within a database, due to the varying frequencies and periods of coverage for different periodicals, as well as the inclusion of single-item titles in some databases, are not reflected in this methodology.

With ProQuest, however, we not only had mixed content but also a large number of different databases with newspaper or wire content included. Our title list did not include information about which databases titles were in. Thus, after filtering to the categories of newspapers, historical newspapers, and wire feeds, we used the library’s online ProQuest subscription to come up with a list of databases including these categories of resources and the number in each database. We could then calculate the percentage of newspaper, historical newspaper, and wire feed sources out of the total titles for each database individually. Percentages were applied to the cost when cost information was available; however, cost information could not be located for several of the databases with relevant content. Because all of our ProQuest usage data was together, we combined all of the estimated costs for databases into one total. We also located ProQuest new data fees, but could not determine how to incorporate this cost item into our analysis.

NewsBank was another case of multiple database components with individual costs. Our usage data from NewsBank included not only titles from Access World News, but also World Newspaper Archive and historical imprints from Archive of Americana, both Readex products. We had straightforward cost data for the annual subscription to Access World News, but the other products included a variety of access fees for different components, including Latin American Newspapers, African Newspapers, and South Asian Newspapers from World Newspaper Archive; Early American Newspapers and Hispanic American Newspapers, which are included in both World Newspaper Archive and Archive of Americana; and Archive of Americana itself. Because our usage data was not separated out according to these different purchase groups, we compiled all of the costs into a total for NewsBank products.

PressDisplay was the simplest cost information, as there was a single subscription cost that corresponded fully to the usage data that we had. However, the different measurement used for PressDisplay usage data meant that cost per use could still not be directly compared with the other vendors.

Although the different circumstances discussed above impacted our ability to have a complete cost analysis, we were still able to do a preliminary ranking of vendors based on the cost per use information that was available (see Table 3). This...
analysis, however, did have a discrepancy in that our usage analysis was based on a calendar year, while our cost data was by fiscal year, beginning in July.

Table 3. Cost per use by vendor

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Use (2012)</th>
<th>Cost per Use</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>EbscoHost Newspaper Source</td>
<td>14738</td>
<td>$0.00</td>
<td>1</td>
</tr>
<tr>
<td>Gale (Academic OneFile, Opposing Viewpoints in Context, Biography in Context; newspaper, newswire formats only)</td>
<td>7855</td>
<td>$0.08</td>
<td>2</td>
</tr>
<tr>
<td>NewsBank (Access World News, World Newspaper Archive, Archives of America)</td>
<td>394274</td>
<td>$0.22</td>
<td>3</td>
</tr>
<tr>
<td>LexisNexis Academic (news sources)</td>
<td>55159</td>
<td>$0.36</td>
<td>4</td>
</tr>
<tr>
<td>ProQuest (newspapers, newswires, historical newspapers)</td>
<td>169410</td>
<td>$0.85</td>
<td>5</td>
</tr>
<tr>
<td>PressDisplay</td>
<td>4909</td>
<td>$2.15</td>
<td>N/A</td>
</tr>
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Quality

We considered several possible elements that might be influential in terms of the quality of a particular newspaper. The difference between current news and historical news became particularly significant in this factor. For current news, we looked at national circulation figures for the top ten US newspapers by average weekday circulation as one possible metric. Usage at the university varied from national circulation trends for regional papers that are not in close proximity to Illinois, such as the Denver Post, and for papers that are more popularly focused, such as USA Today, or in tabloid format, such as the New York Daily News and New York Post (see Figure 7). Local interest was another factor that impacted current news in particular. Local interest can be seen in the high usage of the Champaign-Urbana newspaper, the News-Gazette, as well as more regional papers such as the State Journal-Register from Springfield, IL and the Chicago Tribune.
Figure 7. Usage of top ten major US newspapers (by circulation), 2012–2013

Usage of Top Ten Major US Newspapers (by circulation), 2012–2013

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<tr>
<td>Wall Street Journal</td>
<td>2,410</td>
<td>1,821</td>
<td>2,751</td>
<td>1,865</td>
<td>1,674</td>
<td>1,874</td>
<td>654</td>
<td>684</td>
<td>516</td>
<td>526</td>
<td>500</td>
<td>500</td>
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<tr>
<td>The New York Times</td>
<td>2,751</td>
<td>2,632</td>
<td>2,751</td>
<td>2,632</td>
<td>2,751</td>
<td>2,632</td>
<td>500</td>
<td>500</td>
<td>474</td>
<td>474</td>
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<td>474</td>
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<tr>
<td>USA Today</td>
<td>609</td>
<td>609</td>
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<tr>
<td>Los Angeles Times</td>
<td>489</td>
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<tr>
<td>Daily News of New York</td>
<td>617</td>
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<tr>
<td>New York Post</td>
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<tr>
<td>Denver Post</td>
<td>32</td>
<td>32</td>
<td>32</td>
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<td>32</td>
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<td>32</td>
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<tr>
<td>Chicago Tribune</td>
<td>106</td>
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Average weekday circulation:
2,378,827; 1,865,318; 1,674,306; 653,868; 516,165; 500,521; 474,767; 470,548; 416,676; 414,930
Circulation statistics: Alliance for Audited Media. Average weekday circulation October 2012–March 2013. Includes digital editions such as those on tablet computers or restricted websites as well as branded editions, which include regional editions or those tailored for commuters.

Historical news, however, often has different purposes than current news, and thus would likely need different metrics. While many of the library’s historical newspaper subscriptions were not included in this study, ProQuest Historical Newspapers were a large portion of the ProQuest usage, and NewsBank included some historical materials as well. At an institution such as the University of Illinois, access to historical newspapers is important for research purposes and provides significant amounts of usage. Data mining could also play a role in the research use of newspapers. While this activity is not the intended usage of the newspapers from the perspective of vendors, it does indicate that the newspaper is filling a particular patron need.7

Overall, quality is difficult to measure with newspapers because we do not have an objective metric such as Impact Factor to evaluate usage across institutions. Now that the Counter Project is providing a usage factor which measures median use we plan on implementing Usage Factor as a quality metric in our future work.

Conclusions and Next Steps
Our study discovered the difficulty of assessing quality on newspaper content with an objective
metric, but the authors are hopeful this will be possible to accomplish using the COUNTER project’s forthcoming median Usage Factor. The study successfully measured both utility and cost across our collection. Both utility and cost presented challenges to collect data, which was objective, but one certain conclusion from our data was that only a small fraction of titles drive use across every vendor, and specifically the New York Times and Wall Street Journal both current and historical are extremely important titles for researchers. Ranking titles and vendors on cost and utility will be a valuable tool for our library when making collection development decisions.

Many new questions arose during our study. Duplication of titles across two, three, or four vendors and combined with low usage calls in to question the cost charged by each vendor. While a small number of titles were used heavily, a majority of titles are used less than twice per year, and most are never used—why are so many newspapers never used? Some possibilities are problems without discovery systems or link resolvers, or the possibility that many minor newspapers are simply not very useful to scholars. Another related issue was the lack of high quality metadata that hindered our analysis, from missing languages, lack of consistent identifiers for individual titles, and for de-duplication, no uniform titles or coverage dates. Our study also identified that data mining exists across our collection of newspapers, and the lack of metrics to identify computer usage versus individual usage makes it difficult to make objective collection management decisions about some newspapers, which are heavily used in one month, then never used in subsequent months.

One final issue that hopefully could be addressed in the future is a change to the COUNTER reports, which makes a distinction between journals with articles and other serials which contain articles, since a newspaper would have dozens of articles in a single issue compared with a journal which might have a small number. Another type of report that would be useful would be usage grouped by purchasing unit—e.g., NewsBank’s Early American Newspapers is broken down by title for usage, but we buy as a group and do not have a usage report for that aggregation.

Next Steps
In 2014, we plan on continuing to collect 2014 usage data and cost data. A more comprehensive effort will analyze coverage across vendors to reduce duplication of content. Identifying usage of languages other than English was a common comment in discussions on campus. Cost data will continue to be collected for 2013 and 2014, and we will also try to identify acquisition costs along with annual costs. Rank data will be calculated for both cost in quartiles (0–3) and utility in quintiles (0–4) following the CDL model. Quality will be measured using the Usage Factor, along with consultation with library faculty and department faculty to identify important newspapers in our collection with a Boolean variable (0–1). The combination of Utility Quintiles, Cost Quartiles, and Quality Boolean factors will be combined to measure each title and vendor with a weighted value analysis, which we hope to have completed in 2015.

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Notes

2. Categories selected were: “aggregate news sources,” “news,” “news/newsletters; news/newspapers,” “news/newspapers,” “news/wires,” “newspapers,” “newspapers, companies & organizations,” “newspapers, industry trade press,” “newspapers,news,” “newspapers, newswires & press releases,” “newspapers, newswires & press releases, popular combined sources,” “newspapers, web-based publications,” “newswires & press releases,” “newswires & press releases, news,” and “web-based publications, news.” However, many of the titles in the LexisNexis usage data did not match with titles and corresponding categories from the LexisNexis title list. Titles with substantial usage were investigated manually to determine whether they fit the news categories or should be removed, while titles with low amounts of usage were left in the analysis.
3. For ProQuest in 2012, the need to use data from two separate platforms likely led to some inflation in title counts due to additional title overlap.

4. Usage from Gale mainly came from Academic OneFile, with Opposing Viewpoints in Context and Biography in Context also included, but we only had cost data for Academic OneFile and the comparison was done using this cost information and the combined usage.

5. Databases for which cost information was not found were Alt-PressWatch, GenderWatch, International Newsstand, ProQuest Civil War Era, and British Periodicals (although this database was less than 1% historical newspapers). The costs for American Periodicals and Historical Times of India in acquisitions information were only listed as estimate costs and not payments, but were still included in our total. Acquisitions information also included Access Fees listed as $0 for Ethnic NewsWatch and Historical Chicago Defender. For ProQuest Historical Newspaper databases, individual costs were located for Chicago Tribune, Los Angeles Times, New York Times, Wall Street Journal, and Washington Post. (The costs for Los Angeles Times were not specified as historical, but the only electronic access that the library has to this newspaper as an electronic resource from ProQuest is for the historical database. A separate cost for Historical LA Times annual fees was $0.) There were also two general charges for ProQuest Historical Newspapers, which we took as covering the other ProQuest Historical Newspaper databases.

6. The costs for Hispanic American Newspapers and Archive of Americana in acquisitions information were only listed as estimate costs and not payments, but were still included in our total.

Until recently measurement of scholarly influence was the exclusive domain of specialized citation indexing tools, relying principally on citations to articles published in select journals to construct an understanding of individual scholar reputation. Parallel developments in recent years have brought analytics and Internet search optimization tools to any savvy Internet user. These developments have given rise to altmetrics, the process of expanding the measurement of scholarly impact to include the social web, beyond traditional citations. The convergence of the tools and models of the past with the analytical tools of the online environment opens a space for innovation and poses an interesting challenge for libraries to define a role.

For librarians to shape a service that may assist scholar-practitioners and graduate students to find their way with altmetrics and scholarly promotion, more needs to be known about how these groups perceive and engage with the tools available to them. Our research explores this terrain, querying participants on what issues they face when trying to establish, grow, and/or measure a scholarly presence on the web, as well as how they negotiate these issues. From this we discern and suggest ways in which academic librarians can assist scholar-practitioners and students to create, discover, and manage elements of online reputation using traditional and emerging tools for measuring influence.

BACKGROUND
The idea of altmetrics dates from 2010 when Jason Priem, doctoral candidate at the School of Information and Library Science at the University of North Carolina at Chapel Hill, used the term, fittingly, in a tweet. An influential manifesto written by Mr. Priem and three other researchers followed, articulating the limitations of traditional filters of academic quality: article citations and journal impact factor. Subsequently, Heather Piwowar, researcher and altmetrics advocate, cited four potential advantages to altmetrics:

• a more nuanced understanding of impact, showing us which scholarly products are read, discussed, saved, and recommended, as well as cited;
• often more timely data, showing evidence of impact in days instead of years;
• a window on the impact of web-native scholarly products like datasets, software, blog posts, videos, and more; and
• indications of impacts on diverse audiences, including scholars but also practitioners, clinicians, educators, and the general public.

In our review of the literature, we noted that institutions focused on applied research were not represented in altmetrics discussions. As librarians from small universities with emphasis on applied programming, this lack of representation surprised us; this type of institution is home to many scholar-practitioners who undertake significant work that is often not published through traditional channels. For example, nongovernmental organization reports, briefing notes, papers of all kinds, and instructional resources are frequently published by applied scholar-practitioners, but up until recently have been difficult to track for impact.

As altmetrics now offers a way to gauge the level of influence that diverse types of published scholarly work may have, we believe there is an opportunity for libraries to define new services related to scholarly profile curation and management. In
order to derive greatest benefit from altmetrics tools, the intentional development of an online scholarly profile is necessary. “Online scholarly profile” refers to all of the digital footprints left by scholar-practitioners on the web. This might include published articles, books, tweets, blogs, datasets, reports, comments, presentations, academia.edu profiles, or any other data that is published by a scholar-practitioner online. Advising on how to most effectively keep track of and represent the influence of all these types of online materials is an opportunity for librarians to support scholar-practitioners.

METHODS

In order to explore scholar-practitioner and graduate student attitudes and practices related to altmetrics and online scholarly profiles, semi-structured interviews occurred with 18 scholar-practitioners and 5 graduate students from two institutions: Royal Roads University (RRU) and Vancouver Island University (VIU). Interviews ranged from 45 minutes to 1.5 hours. Participants were chosen based on factors that included publication record, including both traditional and alternative channels of dissemination, and demonstrated interest in new modes of scholarly communication and networking. At VIU, the annual institutional report on scholarly activity, which lists the scholarly output and service of all faculty members, was consulted. From this guide we identified individuals who were actively engaged in scholarship. We then researched these scholars through publicly accessible tools like Google Scholar, Mendeley, and Impact Story to see if the work of these individuals was represented. Subsequently, we contacted these potential participants, requested an interview, and offered to show individuals the impact of their work using reports drawn from altmetrics tools, as available. Graduate student participants were recruited via snowball sampling.

Scholar-practitioners and students who chose to participate were queried about their impressions of traditional scholarly metrics, engagement with altmetrics and social media, and opinions regarding potential academic library roles in providing services related to altmetrics and scholarly reputation. Participants were also shown the impact of their scholarly work using reports drawn from altmetrics tools, as available.

Traditional to emerging metrics tools including Web of Science, Google Scholar, Mendeley, Impact Story, and Plum Analytics were demonstrated and discussed. Interview data was transcribed and analyzed with Google Drive applications.

FINDINGS

Participants were first queried about how they use the Internet professionally, and their knowledge of impact and altmetrics. Every participant had run his or her own name through Google for professional purposes. Only 3 of 23 participants were very strategic about their online presence, having built Google Scholar profiles, searched their names through altmetrics tools, or otherwise had a systematic approach to online identity. There was general awareness of impact related to journal impact factor, and a general perception that this calculation was important, although most participants could not articulate why.

The term “altmetrics” and associated tools were new to 16 of 18 participants. Participants affirmed the perception that altmetrics can be of value in helping to craft a story that describes the value of their research and its diverse outputs, as opposed to simplistic benchmarking. When participants had prior knowledge of altmetrics tools, it tended to be very narrow and deep, and perhaps field specific. For example, one interviewee told us about a tool called the Carbon Capture Report. This site tracks and ranks the tone and activities of individuals who post and publish about climate change and alternative energy in social media.

Whether participants felt that altmetrics and scholarly profile tools were important to their own careers, or not, depended on several variables:

• Career stage: Younger scholar-practitioners recognized that these tools are becoming increasingly important. Several participants close to retirement also recognized value, not necessarily for themselves, but for their graduate students. We had several graduate students participate in our study at the urging of their supervisors.

• Career aspirations (or lack thereof): Several participants did not plan on changing jobs, so felt that altmetrics were unimportant to them.

• Institutional structure and value placed on research: Most VIU participants commented that the lack of a tenure-based advancement system at their institution, and weak
incentives to pursue an active program of scholarship, corresponded to a low incentive to track influence.

- Home discipline: Scientists in our sample were more familiar with the tools that we presented and quickly understood their importance. We believe this to be related to a predisposition in the sciences toward quantitative methods. For example, upon hearing about ORCid numbers (persistent digital identifier numbers for individual researchers), one chemist in our study immediately perceived a parallel with Chemistry Abstract Service (CAS) numbers.4

- Major grant applicants: Those participants who actively applied for major research grants were enthusiastic about the possibility of demonstrating their impact beyond traditional means.

Thus, to what extent interviewees were engaged with scholar-practitioner profiles and altmetrics tools depended on whether people knew about them or not, but also depended on perception of direct relevance. Philosophical beliefs about social media and privacy boundaries also factored into decisions to use profiles and altmetric tools. Some participants were averse to posting about themselves online, while others felt it impossible to separate their private and public selves. Other participants mentioned that how one is expected to behave within particular disciplines might play a role. In more traditional disciplines, promoting one’s own work on social media would be frowned upon, the person labelled a braggart. In other fields, self-promotion is completely accepted.

By far the most common barrier to the use of these tools that participants noted was time. It takes substantial time to setup, track, and ensure that profiles are continuously updated. Some participants mentioned that they delegated this type of work to graduate students. Other participants mentioned not having the time to learn about and determine which particular tool(s) is best for their disciplines. The stage of development of tools also was influential in how and whether people decided to engage with tools. With high production values, including effective and informative visual displays customized to the scholar, PlumX was a favourite tool among participants.5 Sites that looked less polished and had fewer features inspired less confidence among participants.

Participants expressed some skepticism over what altmetrics tools could accomplish, how these sorts of measures might be “gamed,” and how to make meaningful comparisons across or within disciplines. Also, through a labour-management lens, there was some concern about faculty being reduced to numbers and then compared to one another.

Many of the participants were surprised to see their professional identities represented online, having never or seldom uploaded professional content to the web themselves. In many of these cases conference organizers, journal staff, or co-authors uploaded abstracts, conference presentations, and articles without active participation from our study participants. Seeing how evidence of their work is already represented online, whether they like it or not, led participants to feel a need for guidance and assistance. When the interviewees were asked if such a service might be situated in the library, all affirmed a role for librarians. There was also general support for the idea that indicators of influence related to scholarly publication could be more diverse than citations, capturing different kinds of use, and that the influence of non-journal publications could also be indicated.

SHAPING A LIBRARY SERVICE
A number of ways in which librarians can support scholar-practitioners and graduate students with profile and altmetrics tools have been identified through this research:

PERSONALIZED SUPPORT
As outlined above, participants’ attitudes toward altmetrics and a potential library service in this area varied substantially based on stage of career, field of scholarly activity, institutional value placed on research and publishing in faculty role, in/formality of institutional promotion requirements, dependence on traditional impact measures to obtain and retain funding, time, awareness of tools, perceived readiness of tools, and disciplinary view of tools. Consequently, users’ objectives will vary greatly, and any service needs to be highly personalized in nature. While an online library guide to altmetrics and curating scholarly profiles online would be a useful tool to introduce users to the concept of altmetrics and scholarly profile, and may provide a starting point for the enterprising and self-motivated, it is only a first step.
ESTABLISH GOALS
Participants in this study listed several different reasons for wanting to build and measure a scholarly profile online: tracking the influence of their work outside of traditional journal literature, building an audience outside of the academy, and making connections to other researchers with interest in the same area but perhaps in other disciplines, and attracting graduate students and funders. Librarians can highlight the opportunities and strengths afforded by various tools and recommend particular services based on the goals of individuals.

TOOLS
As professionals often connect with both social media and scholarly communication, academic librarians are in a prime spot to act as guides in orienting scholar-practitioners and students to the altmetrics environment and social media conventions for academic purposes.

One of the main places where librarians can assist scholar-practitioners and students who are starting out with establishing a scholarly presence online is to go over the tools available and make recommendations as to which to use. With so many tools and sites, participants asked: Which tools offer the features that I am interested in? Which ones are my colleagues using? What’s best for my discipline? One participant stated that developing a “road map” of exactly which tools to use and what had to be done to maintain them effectively would be helpful.

ORIENTATION TO THE ALTMETRICS AND SCHOLARLY PROMOTION LANDSCAPE
Librarians can provide education and guidance on specific actions to take and tools to use, but we also have a role in encouraging users in developing nuanced perceptions of social media. Research participants expressed a wide spectrum of attitudes toward social media and alternative channels of disseminating their work. These attitudes ranged from seeing social media as nothing but flame wars and egocentrism to perceiving it as a critical, emerging venue for dissemination.

A key hurdle to utilizing social media is an aversion to self-promotion. A majority of participants in this study commented on being uncomfortable with promoting their own work in social media and creating what one participant referred to as a scholarly “egosystem.” Another participant worried about being “dismissed as a braggart.” Although this study examined only a small sample of 23 individuals, trends emerged related to self-promotion conventions within disciplines. Participants from interdisciplinary backgrounds, for example, had less concern about self-promotion than those in natural sciences. As all participants were of Canadian nationality, we could not help but wonder if our stereotypical national politeness and aversion to limelight played a role. A cross cultural study of how academics view online promotion would be useful in determining what demographics most influence participation. Regardless of the motivation for shying away from social media, librarians can assist service users by drawing a distinction between useful promotion of one’s own scholarly work, and egoism.

PREPARING USERS FOR THE TOUGH TIMES
At the same time that they aspired to a broader audience, a handful of participants expressed fear that once released into the digital wilds beyond the academy, their work might be misinterpreted or misused. One participant explained that this had already happened to him—an article on climate change was cited as proof of “intelligent” design. Others expressed feelings of frustration and uncertainty about how online data they create might be misused/used. Issues with accounts being hacked, services spamming e-mail accounts, and worries that research on controversial topics could be used against a scholar or their broader network (i.e., their graduate students) were also highlighted as serious concerns by participants. If librarians are going to assist our users in setting up profiles online and using various tools, we also share in a responsibility to prepare them for and assist when tough times arrive—including hacks, misrepresentation, and spamming. Making users aware of the potential downside of engaging with profile tools should be a part of any service the library provides.

COPYRIGHT
As scholarly work becomes more accessible and visible, scholar-practitioners and students have amplified responsibility to ensure that their published work is in compliance with copyright law. Librarians can assist by educating about Creative Commons resources and models, enhancing copyright awareness on campus, and
reviewing work that individuals wish to release to the public.

PACKAGING CONTENT
Many academics are accustomed to writing in a particular style for a scholarly audience. Work produced for this specialized audience will not necessarily be accessible to the general public. As one of our participants commented, “I can’t just take out a [research finding], plop it on the Internet, because you’re not going to reach a bigger audience. You’re probably going to reach people who already know about your work through citations and things like that. Translational things take time, repackaging the content for a wider audience. [...] I think as a scientist you have an obligation to share knowledge in as many different formats as you possibly can.” Librarians can help scholar-practitioners and graduate students to identify their audience segments, and to present work in ways that are the most suitable for various forums.

PROMOTING THE NEW SERVICE
In interviews, participants suggested a number of ways that librarians could reach researchers who would be interested in a library led profile and impact service. Several suggested talking to people on campus concerned with knowledge mobilization, as these are likely to be natural allies. Knowledge mobilization is all about getting work out of the academy and making it useful in the community, so measuring the ways in which this happens is a relatively “easy sell” to these potential allies.

As mentioned above, many participants did not know that their work was already represented online. If scholar-practitioners are unaware of how their work is being disseminated and discussed in non-traditional venues, e-mailing publicly accessible impact reports can entice them to learn more and to take an active role in shaping their online profiles.

Aside from direct contact with people whose work is already represented online, librarians can approach scholar-practitioners who are working on research projects, particularly those who are in the planning stages. In addition to providing data management planning guidance, librarians can assist scholar-practitioners in planning where, when, and how to mobilize and track use of the knowledge being produced and disseminated.

Altmetrics are an excellent springboard to use when talking to graduate students and senior undergraduates, who are engaged in capstone projects, about beginning to curate a scholarly profile. While many of these students have not published in journals, they will often begin by giving posters or presentations at conferences. By uploading their posters to their institutional repository or their slides to a site like Slideshare, these works are made accessible online and can be tracked for views and downloads. Teaching graduate students to seed their profiles early, and to deliberately apply online tools for understanding their scholarly influence serves them as they seek to establish themselves in their fields.

CONCLUSION
The opportunity for libraries going forward is to augment their existing role with respect to scholarly profile: libraries have long provided access to and interpreted citation indexes, cited references, and the traditional scholarly publication cycle. The emerging scene challenges libraries to support scholar-practitioners and students to engage with a broader, volatile, and evolving environment in which much may be gained or forfeited depending on how reputation is curated.

Having demonstrated that an interest and need exists on our campuses for a library led service related to scholarly profile and impact measurement, the next step in our research is to pilot a highly individualized consultation service for scholar-practitioners and students. As traditional library services change or disappear, we see this service as a natural extension of library expertise and a meaningful way to provide outreach and support to our scholar-practitioners and graduate students.

—Copyright 2015 Kathleen Reed, Dana McFarland, and Rosie Croft

Notes


Altmetrics 101

Mike Buschman
Plum Analytics, USA

What are people talking about when they say altmetrics? In this fast-paced presentation, Mike Buschman, a leading expert on altmetrics and research assessment and evaluation, gives a primer on altmetrics. After spending a brief time at this talk, you will walk away knowing what you need to know about altmetrics and assessing research in general.

—Copyright 2015 Mike Buschman
Usage Statistics of Electronic Resources: A Comparison of Vendor Supplied Usage Data

Kanu A. Nagra
Borough of Manhattan Community College, The City University of New York, USA

Abstract
Purpose: The goal of this project is to build a consultation source for librarians and professionals interested in planning, evaluating and collecting usage statistics using their preferred criteria from vendor reports.

Design/Methodology/Approach: Usage statistics reports from different vendors are being compared to conduct an in-depth analysis based on important categories such as data type and definitions; data for access platforms; features; and availability of usage reports in local, national, and international standards; sufficiency of data; and the extent of data mining.

Potential Findings: The project’s findings will be used to create an organized source based on detailed analysis of vendor supplied usage reports and comparison against different usage categories, features, and reporting standards. This source will be available to the community for open access use under a creative commons license when research work is complete.

Practical Implications/Value: An in-depth analysis of vendor supplied reports and a consultation source will be of practical use to both librarians and vendors to understand the current state of e-resources usage reports, and it will help in reshaping future steps.

Introduction
In today’s ubiquitous library environment, there exists a variety of practices for delivery, access, and use of library electronic resources. Users can access resources and services in and outside of the library through authenticated access anytime, anyplace using their preferred method of access. From the beginning of the twenty-first century, the nature of electronic resources and their patterns of access and usage have been evolving rapidly. In this environment it is very important for libraries to utilize e-metrics to evaluate usage patterns and deploy available resources effectively to benefit the user community.

According to the Association of Research Libraries, e-metrics is defined as measures of electronic resources. E-metrics help libraries to evaluate the use of electronic resources and services for collection development, to ascertain user perceptions and to utilize available funds competently. An important method to measure and evaluate electronic resources is through collection of usage statistics of e-resources. Usage statistics provide an evidence-based approach and support for effective collection development, price negotiation with vendors for subscriptions, in-house decision making, promotion and communication of e-resources, etc. In addition, usage statistics provide a clear measure to support funding requests made to accreditation boards, funding organizations, and stakeholders to secure grants and donations for the institution.

The usage data available from vendors for e-resources is also evolving similar to e-resources access patterns. The data for e-resources can be captured from multiple sources (web analytics, server logs, vendors, etc.). The focus of this project is vendor supplied usage statistics reports. Currently, e-resource usage reports vary by vendor due to lack of common industry standards. The e-resource vendors supply usage data in variety of categories using different local, national, and international standards. Each standard has its own method and definition to quantify and present data.

In this project, the investigator is conducting an in-depth analysis and comparison of vendor supplied usage reports; data categories and definitions; access platforms; features; availability of vendor reports for local, national, and international standards; sufficiency of data; and the extent of data mining possible in the diverse electronic resources available to BMCC. The goal of this
The project is to build a consultation source for librarians and professionals interested in planning, evaluating, and collecting usage statistics using their preferred criteria from vendor reports. The investigator plans to continue updating this source after the completion of this project based on the availability of existing and future access to electronic resources available at BMCC, as well as future changes from vendors.

**Background and Review of Literature**

In the year 1999–2000, the Association of Research Libraries (ARL) sponsored a major study to develop a standard approach for measurement and statistics for electronic resources. A group of 24 ARL libraries participated in three different phases of this study. This study came up with the recommendations for implication of data collection and measurement of digital collection and services.

E-metrics is one of ARL’s measurement initiatives, which consist of two broad areas: the patron-accessible electronic resources (databases, e-journals, and e-books) and the services that maintain access to electronic resources (technical infrastructure, virtual reference, digitization projects). This project also described parallel national and international projects related to usage statistics of e-resources to consider and review—EQUINOX project (EU-UK), Publishing and Library Solutions Committee (PALS)-(UK), National Commission of Libraries and Information Science (NCLIS), Institute of Museum and Library Services (IMLS), Council on Library and Information Resources (CLIR), and NISO Standards on Library Statistics, etc.

Ashcroft and McIvor recommended cooperation between key players (vendors, suppliers, publishers, and librarians), working practices, and changes in collection management practices. Poll described performance indicators for the electronic services developed and tested in different national and international projects such as “ISO.DIS 2789:2000 information and documentation—international library statistics,” “ARL new measures program,” “EQUINOX: library performance measurement and quality management system,” and “ISO TC 46/sc 8/wg 4: indicators for the electronic library.”

Poll recommended using and comparing these performance indicators to create common ground for both vendors and libraries so that time and effort can be minimized.

Miller and Schmidt put questions on reliability and consistency of data provided by vendors and challenges in collating data through different methods and interpreting the same. Shim and McClure reported that both library community and vendors have much to learn about how best to define, collect, report, analyze, and validate usage statistics. Specific ways to coordinate and encourage cooperation have yet to be developed for various international efforts, and different libraries have their unique dataset requirements. Sumsion reviewed the efforts of revising international standards for library statistics for ISO 2789 and reported issues of working groups because of variation in library environments. Hiller reported that academic libraries in North America are increasingly dependent upon a variety of statistical data from different sources to assist and support library management decisions regarding e-resources usage.

Kato commented that vendor usage statistics vary from vendor to vendor and provided a strategy to use reports for evaluation. The study highlighted the activity of COUNTER and NISO for measurement of e-resources and provided guidelines for its effective use, whereas Mundt stated that statistics for use of networked resources have become increasingly difficult, sometimes partially incomplete and inconsistent for collecting and making use of the data for management decisions. He gave suggestions to standardize statistical usage data.

The Library Journal Standardized Usage Statistics Harvesting Initiative (SUSHI) is a new development that came up in the usage statistics field of e-resources when ANSI approved NISO’s new standard. It works on the principle of an automated request and response model for the harvesting of electronic resources usage data. Conversely, the United Kingdom Serial Group conducted a study on usage and use factor of electronic serials in libraries with the objective to obtain an initial assessment of the feasibility of developing and implementing journal usage factors (UFs). The results were encouraging to develop journal usage factors, as there was support from a large number of respondents for its implementation.
Project Design
The project objective is to prepare a comparison of vendor supplied usage reports of e-resources. An investigator is conducting an in-depth analysis and comparison of vendor supplied usage reports based on the following categories: data categories and definitions; data for access platforms; features; availability of vendors reports in local, national and international standards; sufficiency of data; and the extent of data mining possible in the diverse electronic resources available to BMCC. Currently, the research is in progress by the investigator. The main outcome of this project will be a consultation source that will be of practical use to librarians and professionals interested in planning, evaluating, and collecting usage statistics in their preferred data categories in desired criteria from vendor supplied reports. The consultation source will be available when the research work is complete.

Methodology
The vendor supplied usage reports are in the process of being compared and analyzed for 150 subscriptions-based electronic resources available at BMCC. Usage statistics reports from different vendors are being compared based on important categories such as data types and definitions; data for access platforms; features; and availability of usage reports in local, national, and international standards; sufficiency of data; and the extent of data mining. This will lead to creation of a reference source for librarians to consult, plan, assess, and evaluate e-resources for their libraries.

Practical Implications/Value:
The project's findings will help in creating an organized source for vendor supplied usage reports' comparison and their detailed analysis. This source will be available to the community for open access use under a creative commons license once the research work is complete. This consultation source will be of practical help to librarians and professionals interested in planning, collecting, and evaluating usage statistics in their preferred data categories according to desired criteria from vendor supplied reports. A limitation of this source will be that it can only cover those electronic resources which are subscribed to by BMCC Library; however, this will not have any significant drawback as most key vendors of electronic resources for academic libraries would be covered. The author plans to continue to update this source after the completion of this project based on the availability of existing and future access to more electronic resources, as well as any future changes from vendors. To the best of the author's knowledge, no such resource has been created so far. This project will fill the gap and help both librarians and vendors to understand the current state of e-resources usage reports and help reshape future steps. The primary audience for this source will be librarians, libraries, vendors, and the secondary audience will be library information science faculty, students, and researchers.

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Notes
2. Ibid.
9. S. Kato, “Usage statistics of electronic resources: COUNTER project and the code of


**Bibliography**


Running the Numbers: Evaluating an E-Book Short-Term Loan Program for Cost-Effectiveness

Brendan O’Connell and John Vickery
North Carolina State University, USA

Abstract
North Carolina State University (NCSU) Libraries currently utilize Demand/Patron Driven Acquisition (DDA/PDA) as our preferred purchase option for e-books. Our main vendor for DDA e-books is eBrary. eBrary, EBSCO, and EBL currently offer a Short Term Loan (STL) option as an alternative to DDA. For a percentage of the e-book purchase price, e-book loans can be triggered by patrons for periods of one day or seven days. With eBrary, after three STLs, an e-book purchase is automatically triggered at full price. Therefore, STL will save money for libraries when an e-book is triggered three times or fewer, and cost more than an outright purchase/DDA purchase when an e-book is triggered four times or more. NCSU Libraries does not currently offer an STL option to our users, but we wanted to explore whether this could be a cost-saving model for us.

Methods
We looked at the usage of a testbed of 664 e-book titles over the last three years that were added to our DDA program in January 2010. During the time period January 2010–December 2013, 591 of these e-books were triggered and purchased through DDA. We ran four hypothetical models using SAS to find out if we would have saved money by utilizing either one day or seven day STL as an alternative to DDA for these 591 titles.

Ideally, we would have been able to access session-by-session usage data to know exactly how many times STL would have been triggered. We instead had to work with monthly aggregated usage reports from eBrary, where all the sessions for a month are combined. Unless there is only a single session in a given month, the exact e-book usage is not known to us.

To work around this, we developed two hypothetical usage scenarios: minimum use and maximum use. In the minimum-use scenario, we took the monthly report and extrapolated the minimum number of STL triggers for a given title that could have taken place, based on actual pages viewed and number of sessions. In the maximum use scenario, we extrapolated the maximum number of STL triggers that could have taken place, based on the same variables.

Results

<table>
<thead>
<tr>
<th>Total Purchase Price DDA (what we actually paid)</th>
<th>$62,047.22</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Day STL—Min Use Scenario</td>
<td>$29,196.85</td>
</tr>
<tr>
<td>One Day STL—Max Use Scenario</td>
<td>$61,789.98</td>
</tr>
<tr>
<td>Seven Day STL—Min Use Scenario</td>
<td>$35,784.54</td>
</tr>
<tr>
<td>Seven Day STL—Max Use Scenario</td>
<td>$71,412.62</td>
</tr>
</tbody>
</table>

One day STL represents the best value for us, because even in our maximum use scenario, we would have spent less than the purchase price. In our minimum use scenario, we would have spent less than half with STL than we actually spent with traditional DDA, representing a significant savings. Three out of the four models resulted in savings, while only seven day STL in the maximum use scenario cost more than DDA.
When we ran our cost projection models for STL in spring 2014, we utilized published data from eBrary on STL prices. Average prices for STLs were generally 10–20% of the purchase price of e-books for eBrary titles. As of July 1, 2014, eBrary announced sweeping price changes to STL across the majority of publishers. STL prices doubled or even tripled overnight, rising to as high as 60% of purchase price. At these prices, STL no longer made sense as an alternative to outright purchase or DDA, and we abandoned our inquiry into switching to STL as a DDA alternative.

**Conclusions & Caveats**

Because of the lack of granularity in the monthly usage reports generated by eBrary, the reality of usage (and prices) lies somewhere between the two scenarios, so exactly how much money we would have saved using STL is unknown. In addition, utilizing an STL program turns e-books into an expanding cost rather than a one-time cost, and costs will go up over time as more users continue to trigger more STLs and eventually more purchases.

Savings realized through STL also depend very closely on what percentage of outright purchase price STL represents. For the eBrary titles analyzed here, the average percentage of purchase price for a one day STL was 12.48%, while the average percentage of purchase price for a seven day STL was 18.81%. Given the new percentages as of July 1, 2014, we no longer recommend that libraries pursue STL as an alternative to DDA.

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Defining the Libraries’ Role in Research: A Needs Assessment; A Case Study

Kathryn M. Crowe and Michael A. Crumpton
University of North Carolina at Greensboro

Abstract
The University Libraries at the University of North Carolina at Greensboro partnered with Information Technology Services (ITS) and the Office of Research and Economic Development (ORED) to develop a needs assessment survey. This “UNCG Faculty Research Data Support Needs Survey” was administered to all faculty members in spring 2013 and included questions on the format(s) of their research data, how they store and backup data, how they share/disseminate data, data management plans, and their priorities for support. This paper will discuss the background literature, the survey methodology, how the results were used to identify priorities, steps taken to address priorities, and the benefits of cross-campus collaboration in an assessment project.

Introduction
Academic libraries are increasingly taking on the role of supporting faculty research. In addition to traditional services such as assisting with literature reviews they now also provide resources for data management, digital humanities, open access publishing, and scholarly communication issues. Because of new guidelines by many funding agencies that require data management plans and open access to raw research data, libraries are providing support for developing these plans, storage for raw data, and assistance in archiving data for access.

The University of North Carolina at Greensboro (UNCG), one of seventeen campuses of the University of North Carolina system, is a High-Research Activity University and also earned a “Community Engaged Classification” from the Carnegie Corporation. In 2013–14 the enrollment included 13,640 undergraduates and 2,666 graduate students. With distance learners the total headcount was 17,707. The University Libraries sought to provide additional services for data management and digital humanities. At the same time, other campus units including Information Technology Services (ITS) and the Office of Research and Economic Development (ORED) had a stake in these services. We determined that a needs assessment was essential in order to gain information to prioritize our resources and that it was crucial to collaborate with other stakeholders on campus.

Literature Review
Two important publications regarding data and these issues that are occurring as research data grows beyond normal operating practices are CLIR’s The Problem of Data and the ARL SPEC Kit 336 on Responsible Conduct of Research Training. These publications helped clarify and inform the need for evaluating our own resources and services due to changing priorities on campus. It is also worth noting two other publications, published since this project, that are related and relevant to the intentions served by our study. Another CLIR publication, Research Data Management; Principles, Practices and Prospects, published in November 2013 addresses the baselines established by the DataRes Project and is titled. We also looked at ITHAKA S+R’s Supporting the Changing Research Practices of Historians to see how new tools and technologies are impacting access and discovery methods for data, which are now presented in different formats.

As addressed in The Problem of Data, as the scale of data creation grows, so does the need to determine methods of data creation that properly preserve and maintain data, while providing security and accessibility as needed. For faculty, this can create a life cycle of data from its creation to its use into new knowledge products. It was felt on our campus that this issue needed further clarification as to data stewardship and personnel trained to make appropriate decisions with regard to general curation of data. Larger academic libraries across the globe were beginning to formulate positions within their staffs to address
this need, and we were interested in creating and funding a similar position.

Another concern on campus was in the form of new federal mandates from granting agencies on the proper handling of data, including storage and providing access. These created behavioral concerns for faculty who hesitated to comply and thus were at risk to lose funding or control of their research. In reviewing the ARL SPEC Kit 336 on Responsible Conduct of Research Training we recognized this issue of providing ethical standards for whatever methods were put into place, which also seeded the need for collaboration with our partners in ITS and the Office of Research.

We were somewhat gratified to see in Martin Halbert’s article, Prospects for Research Data Management, in Research Data Management: Principles, Practices and Prospects from CLIR, a list of barriers that supported findings from our survey completed not long before. His list of barriers included issues of funding, lack of organizational structures, and professional preparation. These are similar to our findings in terms of changes that need to be made to institution policies and priorities for managing data properly going forward. Other articles in that same publication promoted the need and help define the structure expected in providing data management services in libraries.

And finally ITHAKA S+R’s Supporting the Changing Research Practices of Historians, looked at discipline-specific needs in terms of supporting research and data curation needs. This seemed important to us because our survey demonstrated multiple differences between disciplines and a customized approach might be warranted to garner support and ease concerns of faculty and researchers who are being asked to change practices and methods. This report also gave good insight into how a researcher views primary and secondary data or local access to non-digital components. We expect to find their recommendations useful going forward.

Needs Assessment at UNCG
Planning for the UNCG needs assessment began in fall 2012. The impetus for this survey was two-fold. First, many funding agencies require data management plans (DMP) as part of their requirements. In addition, UNCG adopted a policy in 2012, “Access to and Retention of Research Data,” that outlines the rights and responsibilities of investigators and the institution in the use, retention, and maintenance of data produced during the research process.

Representatives from the University Libraries, Information Technology Services and the Office of Research and Economic Development met to develop the survey. Together we decided the purpose was to determine faculty needs regarding storing and sharing data, assistance needed with managing and storing data and their priorities for these services.

We consulted other studies and surveys to help us design our instrument. Most useful were The University of North Carolina at Chapel Hill’s survey included in their 2012 report, Research Data Stewardship at UNC: Recommendations for Scholarly Practice and Leadership. We also consulted with Parham, Bodnar, and Fuchs from Georgia Tech after reading their article, “Supporting Tomorrow’s Research: Assessing Faculty Data Curation Needs at Georgia Tech” in C&RL News. They kindly shared their instrument with us. Another useful article was Peters and Dryden’s 2011 article “Assessing the Academic Library’s Role in Campus-Wide Research Data Management: A First Step at the University of Houston.”

We wanted to ensure that respondents understood that “research data” has a broad interpretation. For the purposes of the survey it was defined as:

Information recorded in any form, and includes any materials needed to validate research findings, such as laboratory notebooks, biological specimens, video, photographs, and environmental samples. The policy includes discussion of data collection, retention, archiving; the disposal, removal, or transfer of research data; rights to access of data and data sharing; data security; and export control. In many cases, there are multiple layers of regulatory requirements that impact the use, retention, and maintenance of research data (e.g., federal policy, funding agency specific policies, and state policies).
This definition was included in the invitation to the survey.

The survey sought to help us determine priorities and focus future staffing and other resources to ensure that faculty have the support they need for their research. Collaborating with other units was essential for the success of the survey. Because we each have different roles in supporting faculty research each brought our unique perspective. Blending our strengths made it a much better survey.

Methodology
We spent considerable time developing the survey in fall 2012. It was tested among members of the Senate Research Advisory Committee and vetted in the Research Policies Committee. Questions were included regarding the format of their research data, how they store and backup data, how they share/disseminate data, data management plans, what support they currently receive and their priorities for future support. A few demographic questions included their status (tenure-track, research staff, etc.) and if they currently have external funding. Several qualitative forms provided the opportunity for further comments. We used Qualtrics to mount it. In February and March 2013 the online survey was sent to all faculty, research and post-doctoral staff (1,193 total). One hundred sixty completed the survey for a 13% response rate.

Results
Formats
The first question asked respondents to choose from over 20 options which formats they use for their data. Respondents could choose all that applied. The most-used format is text files (80%) followed closely by spreadsheets (62%), and PDFs (50%). In general, however, faculty use a wide variety of formats, which makes it difficult to generalize. This chart shows the top ten formats used:

![Top 10 Research Data Formats](image)

The next charts group the formats into similar types.
**Storage and Backup**
The next several questions asked how researchers store and back up data. Again they could check all that apply. Most (84%) store data on a hard drive or an external device such as a CD/DVD, USB, external hard drive, or tape (52%). A fairly significant number use non-digital physical locations (46%). Fewer use cloud or remote storage (28%) or a central server (23%).

For back up, very few are using central locations such as network file space (27%) or cloud storage (26%). Most use a CD/DVD, USB, or external hard drive (68%) or a computer hard drive (58%). Respondents could check all that apply so some use more than one strategy. Only 16% automatically generate backup files.

**Sharing data**
The majority of respondents (75%) do not anticipate sharing their data.

Thirty respondents answered a qualitative question about how they share their data. Many indicated they use cloud services such as Dropbox, Google Docs, shared network space or Qualtrics. Others use CDs, file transfer or e-mail. Some responded that the final publication was the dissemination method. Only one indicated they use an online data deposit. One comment indicated a need for automatic back up: “I would like to have automatic backups of data but we do not have a means to do so. This should be a priority in my opinion.”

When asked about barriers to sharing data, 57 responded. Issues included:
- Size of datasets
- Confidentiality and copyright
- Easily accessible access to central storage on campus
- Lack of knowledge about sharing—what can be shared and how to do it
- Compatibility across systems

Thirty-six provided qualitative responses to their support needs for sharing data. Many did not feel they needed support or were not sure what assistance they need. Some felt NC DOCKS is sufficient. (Except for the recent addition of the ODUM service which few faculty have used, NC DOCKS is primarily for published works, not data).
Several indicated they need assistance with how/where to store data including large data sets and audio/video.

**Data Management Plans**

Forty percent of respondents indicated that they had DMPs for current projects; it should be noted that only 97 responded to this question. The chart below shows why they have them. They could check all that applied.

**Priorities for support**

To help us prioritize resources for research support respondents were asked to rank a variety of services. The chart below indicates those ranked very important or important:
### Current Support
Most faculty reported that they do not currently have support for managing and storing data (56%). Those that do have support receive it from personnel in their department (33%) or from ITS (22%).

### Additional support needs
Twenty-three responded to a final qualitative question that asked faculty what other research technology tools or needs they thought were a high priority. Responses included:

- Managed web hosting
- Cold storage for paper documents
- Cloud servers
- Conversion software
- Digital humanities
- Funding for data storage options

### Demographics
Of the 160 individuals who completed the survey, 73 percent of respondents were tenure track faculty and 13 percent were non-tenure track. This compares to campus statistics of 53 percent of...
full-time faculty is tenured and 77 percent hold a doctorate or terminal degree in their field.

The remaining respondents were research or post-doctoral staff. Thirty-eight percent of respondents indicated that they currently have external funding for a research project.

**Follow up and action items**

It was obvious from the results that storage and automatic backup of all types of data (numerical, digital humanities, audio/video) was the greatest need among faculty. Assistance with sharing and data management plans was the second greatest need. While most faculty were backing up their data, they were not following best practices such as using shared storage or the cloud. Many faculty did not seem aware of data sharing requirements or assumed the final publication sufficed as sharing.

UNC Greensboro (UNCG) established several new services for researchers based on the survey results.

The survey provided very useful data to help the stakeholders prioritize services. Because storage and backup were identified as important needs, ITS launched a hosting service, WordPress Multisite [http://itsnews.uncg.edu/2013/09/06/new-service-wordpress-multisite/](http://itsnews.uncg.edu/2013/09/06/new-service-wordpress-multisite/), in September 2013 for researchers who need a content management platform. It is available at no cost to UNCG researchers. ITS also launched a Box cloud storage pilot in fall 2013 and expanded it in 2014 to include 50 GB of storage for each user. Researchers may also share data with researchers at other institutions through Box.

In 2012 the UNCG University Libraries began providing social science data storage at no cost through the Odum Institute DVN at UNC Chapel Hill. This DataVerse Network is a container or centralized repository for research data studies that can be customized and managed by its owner. It is a web application for cross-disciplinary data in the social sciences and meets the mandate requirements of funding agencies for data storage and access.

We expanded options to make more data accessible through the libraries’ institutional repository, NC DOCKS [http://libres.uncg.edu/ir/](http://libres.uncg.edu/ir/). Currently this includes work of UNCG faculty members and some student work and must be scholarly, research, or educational work. All of the materials in NC DOCKS is open access and searchable. In addition, all academic departments and programs have a libraries’ liaison that works closely with faculty to ensure that the resources fit their needs and to assist with research. Specialized services to faculty include electronic journal publishing support, digital image hosting, and an open access journal publishing fund. The data service librarian provides assistance and consultation with statistics and numeric data discovery, ICSPR and statistical software. ERIT, the libraries’ IT department provides faculty support for data management and digitization projects. The Hodges Special Collections and University Archives Department (SCUA) offers unique archival collections and finding aids and research guides.

The libraries created an outline of a position that would be expected to train and be the expert on research support and data services. A copy of this position draft is Appendix A, and it is expected that the libraries will move forward when funding is secured. Note that this draft does not require an MLS, which is a product of research on similar positions and discussion over the skills needed for these functions, differently from typical librarian competencies. There is a trend in research libraries to forgo the MLS requirement in lieu of other skills more closely associated with the analysis and curation of data.

The Office of Research and Economic Development has now created a Researcher Zone [http://researcherzone.uncg.edu/](http://researcherzone.uncg.edu/) that directs faculty to a variety of departments, offices, and support resources for multiple needs, including data management. The libraries are part of this portal with all services and resources listed. The Office of Sponsored Programs (OSP) which is part of ORED provides data management plan assistance to faculty who are writing grants. The libraries and OSP collaborate on the DMPTool and how to offer it to UNCG researchers.

The survey also provided evidence that there was a lack of awareness among faculty about DMP and data sharing requirements and how to find resources for assistance. A team in the libraries including the authors, head of libraries’ IT, the science liaisons, the data services librarian, and the metadata librarian began meeting in spring 2014 to discuss strategies for increasing awareness. We
decided first to conduct follow-up interviews with faculty and research support personnel on campus. The interviews confirmed that support for these activities vary widely among departments and schools and that there is a big need for training and awareness. To address these issues the team developed the following action plan:

• The libraries provided support for the data services librarian to receive additional training so that she can be a “first responder” for data management needs to provide general guidance.

• A Research Data Management LibGuide (http://uncg.libguides.com/RDM) was developed to bring together in one place information resources for data management plans, data storage, and data archiving and storage. It includes campus resources, tutorials, and links to repositories. The guide was marketed to appropriate audiences through blogs, the campus online newsletters and e-mail blasts, and linked from other LibGuides and web sites.

• Training for libraries’ liaisons was developed so that they feel more comfortable with the resources available to advise their faculty.

• The data services librarian presented at the Research Advisory Council, which is a group composed of the primary research administrators from each academic unit, and at departments as needed. She also provided training for graduate students.

Conclusions
The survey was a very useful and positive experience. The collaboration with ITS and ORED provided the libraries the opportunity to work with other units and blend our shared expertise. We all gained important information about faculty needs and priorities regarding research data. Such partnerships help raise the profile of the libraries as essential to the research process.

The experience provided us with a broader awareness of the issues academic libraries are facing with regard to research and data services. As stated in the literature, these are issues being addressed across the profession that provide opportunities for new partnerships, skill development, and strategic planning on the part of library administrators.

Important services were implemented that will improve access to storage, archiving, and assistance with data management plans. In addition, we were able to provide needed training for the campus.

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Bibliography


Appendix A

Research and Data Support Coordinator

Position Summary:
The University of North Carolina at Greensboro University Libraries is actively expanding its support for faculty research campus wide. We seek a dynamic individual to serve as research and data support coordinator to organize, plan, and coordinate the libraries’ interdepartmental initiatives to support faculty research in a collaborative environment. Working within the libraries’ Electronic Resources and Information Technology Department (ERIT), the research and data support coordinator coordinates the libraries’ provision of the following services in support of faculty research: research data management, digital humanities tools, website design, user interface design, database development, digitization services, and content and application hosting and development. The research support coordinator will meet with faculty researchers, assess their needs, recommend options and solutions, and, as needed, direct faculty to appropriate support resources within the libraries and campus wide. The position works with faculty, academic units, and research centers, assisting in managing, describing, preserving, and making research and data available and accessible to appropriate audiences. The position will assist faculty with writing data management plans, will work closely with the libraries’ subject liaisons, and will provide library-wide training, research, and assistance for our research and data support initiatives. This position is best suited for a candidate with a broad understanding of IT, in order to effectively coordinate the interdepartmental efforts of library specialists in areas such as programming, web design, metadata, digitization, and data curation.

Responsibilities:
Provides library-wide, interdepartmental coordination of the libraries’ team-oriented research and data management support programs, which will include significant participation from Reference and Instructional Services, Special Collections and University Archives, Music, Cataloging, and potentially other library departments:

• works closely with the UNCG Office of Research and Economic Development (including the Office of Sponsored Programs), UNCG Information and Technology Services, faculty research committees, and other campus stakeholders to ensure efficient and effective support for researchers;
• assists faculty with technological elements of grant applications, and with crafting effective data management plans;
• works closely with library subject liaisons to make sure they are kept informed and that they can assist in communicating research and data management support opportunities and options to faculty;
• conducts training, group instruction, and/or workshops;
• contributes to and is active in state, regional and national meetings, conferences and workshops, reviews professional literature, and networks with professional colleagues outside of the university to stay informed about developments and trends in research support.
Required Qualifications:
- Advanced degree
- At least two years of experience in at least one of these three: academic libraries, grant specialization in sponsored programs, or grant coordination for externally funded programs
- Excellent oral and written communication skills
- Strong service orientation
- Demonstrated knowledge of significant trends and issues in research, research support, and data management plans
- Demonstrated ability to work in a collaborative environment that encourages personnel to work across departments to support the goals and initiatives and priorities of the libraries
- Strong analytical and decision-making skills
- Experience with project management
- Basic understanding of a broad range of information technologies, including programming, hardware, digital humanities tools, website design, user interface design, database development, digitization services, and content and application hosting and development

Preferred:
- Demonstrated experience with two or more of the following—programming, hardware, digital humanities tools, website design, user interface design, database development, digitization services, and content and application hosting and development
- Experience with data management plans
- Grant writing experience and familiarity with federal funding requirements
Shaping Collections in a Connected World: Collection Development Assessment Using Borrow Direct Data

Sarah Tudesco
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Abstract
Purpose: The purpose of this study is to determine whether Yale’s high usage rate of Borrow Direct is indicative of gaps in collection development practices.

Design: The study uses detailed Borrow Direct bibliographic data from the Borrow Direct reporting system (MetriDoc—hosted by the University of Pennsylvania) as well as data from Yale’s local catalog. Using various match points, items that were requested and locally held were compared with requests for material not represented in Yale’s collection.

Preliminary Findings: The data shows that over 60% of the requests from FY2011–FY2013 were held locally at Yale.

Value: The preliminary findings demonstrate that Yale patrons are using Borrow Direct as a system to quickly get copies of materials already held at Yale. The data shows that students are using the service to access popular materials.

Introduction
Borrow Direct is a rapid book request and delivery system that enables Yale patrons to search and request eligible circulating items from Brown, Columbia, Cornell, Dartmouth, Harvard, University of Pennsylvania, University of Chicago, Johns Hopkins, MIT, and Princeton. The combined collection encompasses over 50 million volumes.

The Borrow Direct service started as a partnership between Columbia, University of Pennsylvania, and Yale in November 1999. The mandate of the original group was to provide rapid and predictable access to materials not owned on campus while keeping the cost per transaction as low as possible. Since Borrow Direct was established, policies and systems have evolved. There are now 12 participants, and many of these partner institutions promote the service as an alternative to recalls—items that are checked out at Yale are eligible for request.

Borrow Direct has been an incredibly popular service at Yale. Every year since the inception of the service, the number of requests submitted by the Yale community has increased. Yale also borrows more than the other Borrow Direct partner institutions. The popularity of the service combined with the volume of requests increasing year over year has prompted the collection development department to look at the service more closely.

As the Borrow Direct service has grown, many participants have started to explore the service as a foundation to build cooperative collection development initiatives. Music librarians started a focused initiative in 2007 that divided purchasing among select partners based on composer. Other initiatives have been discussed, but these often concentrate on collecting materials that are traditionally low use, more obscure publishers, or non-English materials.

If the goal of collections is to prioritize expansive access to materials, Borrow Direct is an important service to consider. Understanding how patrons use this service will help complete the picture of how effective our local collections are in meeting the needs of the community.

Design/Methodology/Approach
The existing Borrow Direct data hosted on the MetriDoc system provides many fields that are useful for reporting. Our study was interested in answering the following questions:
• Who at Yale is using Borrow Direct?
• What subject areas are they requesting?
• Why are they requesting material?
• Does the high Yale usage represent collection development gaps?
The Borrow Direct data included fields that could be used in the analysis:

- Patron Type: records the status of the patron making the request
- Call Number: records call number information; data was refined to enable reporting on LC Class and LC Subclass.
- Locally Held Item: the field indicates whether the item requested has a local holding. When the local holding is unavailable (checked out, missing, non-circulating) patrons are allowed to request a copy held at another institution. This field was recently added to the system.
- ISBN: the field was used as a match point to determine locally held status of items requested between FY2011 and FY2013.

The study compared Borrow Direct Yale request data with local library holdings from Yale’s online catalog. The ISBN field was used as the match point between the two systems. This allowed us to analyze the locally held status of materials requested since FY2011.

**Preliminary Findings**

Yale patrons have been requesting more and more material using Borrow Direct. In FY2014, Yale patrons requested 45,220 items; Penn was the second highest user, with 35,350 requests.

**Figure 1: Borrow Direct requests by Yale patrons by fiscal year**

![Graph showing Borrow Direct requests by Yale patrons by fiscal year]

Collection development is very interested in who is using the Borrow Direct service. Graduate students request the most material, followed by undergraduates, and then faculty.

We examined all requests made between FY2010–FY2014, and the top five subjects are:

1. **P—Language and Literature:** 29,565 requests
2. **H—Social Sciences:** 23,457 requests
3. **B—Philosophy, Psychology, Religion:** 20,472 requests
4. **D—World History:** 16,473 requests
5. **N—Fine Arts:** 11,379 requests

Looking at the local availability of items requested between FY2011 and FY2013, over 60% of the materials was held in a local Yale collection. The percentage of materials requested in the most popular LC subclasses was even higher, averaging 70% in the most popular categories. Here is the frequency of the most popular LC subclasses requested by Yale patrons:
1. PN—Literature, Literary History and Collections: 73% items locally held
2. PR—English Literature: 69% items locally held
3. PS—American Literature: 68% items locally held
4. B—Philosophy, Psychology, Religion: 73% items locally held
5. BS—The Bible: 83% items locally held
6. BL—Religions, Mythology, Rationalism: 68% items locally held
7. HD—Land, Agriculture, Industry: 59% items locally held
8. HQ—Social Groups: 73% items locally held
9. HV—Social Pathology, Criminology, Welfare: 57% items locally held

The preliminary findings need to be further examined; so far the trend at Yale seems to be mirrored at other partner institutions. In January 2014, the reporting data for the Borrow Direct service added a “Local Item Found” field. The following table represents requests from the end of January 2014 through June 30, 2014.

<table>
<thead>
<tr>
<th>Library</th>
<th>Local Item Found</th>
<th>No Local Item</th>
<th>% Locally Held</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yale</td>
<td>8,642</td>
<td>9,221</td>
<td>48%</td>
</tr>
<tr>
<td>Brown</td>
<td>3,153</td>
<td>3,956</td>
<td>44%</td>
</tr>
<tr>
<td>Columbia</td>
<td>6,966</td>
<td>6,664</td>
<td>51%</td>
</tr>
<tr>
<td>Cornell</td>
<td>8,112</td>
<td>6,016</td>
<td>57%</td>
</tr>
<tr>
<td>Dartmouth</td>
<td>2,386</td>
<td>4,674</td>
<td>35%</td>
</tr>
<tr>
<td>Harvard</td>
<td>6,854</td>
<td>1,040</td>
<td>59%</td>
</tr>
<tr>
<td>MIT</td>
<td>88</td>
<td>7,540</td>
<td>8%</td>
</tr>
<tr>
<td>Penn</td>
<td>6,327</td>
<td>5,661</td>
<td>46%</td>
</tr>
<tr>
<td>Princeton</td>
<td>8,973</td>
<td>2,534</td>
<td>61%</td>
</tr>
<tr>
<td>UChicago</td>
<td>3,507</td>
<td>9,221</td>
<td>58%</td>
</tr>
</tbody>
</table>

**Practical Implications/Value**

Collection development wants to use data to better inform collection policies, and understanding services that are used to extend access to collections is an important part of that process.

The Borrow Direct service has expanded and developed over the years, and from the data examined in this preliminary study, it looks like the patrons are using the service to access materials that may not be immediately available on campus. They turn to the service as a more efficient mechanism to request materials that are already checked out.

Yale’s collections budgets have been under significant stress these past few years. Budgets have been flat, and expenses have gone up. To maintain a broad collection policy, duplicate purchasing has been curtailed these past few years. In the past, duplicate copies of materials might have been purchased to meet these needs—now patrons are pointed towards Borrow Direct to meet those needs.

It will also be interesting to observe how the growth of e-books will impact the service. Borrow Direct is a service that is used primarily to borrow monograph—as collections become more accessible electronically, it will directly impact the ability to share these materials.

Borrow Direct is an important service at Yale. However, as we look at services like this to extend access to collections, it is important to understand why the community finds them valuable.

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**Notes**

Introduction

There is an increasing focus in colleges and universities on the quality of undergraduate education and its role in preparing students for the workplace and graduate study. Learning through direct experience with research projects is one recognized means for undergraduate students to develop the skills necessary to succeed after graduation. Indeed, the seminal report of the Boyer Commission on Educating Undergraduates in the Research University\(^1\) acknowledges this through its recommendation to “make research-based learning the standard” for undergraduate education. The commission advocates for students to participate in and learn through research and primary source materials beginning in their first year of college. These research experiences can help students to develop “the abilities to identify, analyze, and resolve problems [that] will prove invaluable in professional life and in citizenship.”\(^2\)

While some students involved in undergraduate research have opportunities to co-author articles with faculty mentors, they may not have the opportunity to take a leadership role in preparing a publication or to experience the publication process from start to finish. It is also often unclear to readers what the specific contribution of the undergraduate was to the paper, especially in science and engineering subjects where large numbers of authors may be listed. Undergraduate research journals fill that gap. They provide students with the opportunity to author articles about their research projects and to experience the spectrum of the process from submitting a paper proposal to checking proofs. The student authors also get full credit for their work and can use offprints in applications for graduate school or employment.

For universities that want to establish undergraduate research journals, the library is a logical publishing partner. Librarians can share expertise in scholarly communication issues with students and faculty as well as provide instruction on information literacy skills critical to the preparation of articles. Furthermore, many libraries have established infrastructure, services, or partnerships in support of publishing activities. In 2011 an estimated 55% of academic libraries of all sizes were either developing or implementing publishing services (including 79% of the largest, ARL research libraries).\(^3\)

At Purdue University, scholarly communication and information literacy are strategic priorities for the Purdue Libraries. The Purdue University Press is a unit of the libraries, and the director of the press is also the head of scholarly publishing services for the libraries. Together, this organizational alignment and the strategic priorities of the libraries provided an ideal collaborative setting for the founding of the Journal of Purdue Undergraduate Research (JPUR). The office of the provost initially funded the journal for three years, with further funding dependent on the journal’s ability to demonstrate a connection between student participation in the journal and student success. In order to evaluate any such relationship and provide data for future funding decisions, the journal’s advisory board developed a comprehensive assessment plan. The fact that the office of the provost recently funded the journal for a fourth year indicates that the journal has had a positive impact on student success—and that the assessment methods described in this paper were able to establish a connection between student success and participation in the journal.

Literature Review

The literature clearly demonstrates that undergraduate students benefit from engaging in
Weiner and Watkinson

research experiences. Studies indicate that student participation in research had a positive influence on their persistence and degree completion.\textsuperscript{4} Students experienced gains in career aspirations; professional identity; confidence with and understanding of their subjects; knowledge of the research process; dissemination of research orally and in writing; teamwork and working independently; understanding of scholarly literature; and computer and statistical skills.\textsuperscript{5}

Writing and publishing study results is an integral part of the research process, often lacking in undergraduate research.\textsuperscript{6} The undergraduate research journal is a relatively new means for this scholarship dissemination. In 2008, there were around forty such journals published in the United States,\textsuperscript{7} and there were 115 in 2013.\textsuperscript{8} But the literature on undergraduate research journals is sparse. Although there has been some controversy about this type of publication with some faculty preferring that students publish as their co-authors in disciplinary journals,\textsuperscript{9} some authors acknowledged the benefit of such journals, for example, as a symbol of an institution’s commitment to undergraduate education.\textsuperscript{10}

Students surveyed at the University of Plymouth thought that an undergraduate research journal “fostered a greater understanding of the research process and…could stimulate additional critical discussion in the classroom.”\textsuperscript{11} Other examinations found that students appreciated the personalized interaction and critique between editors, reviewers, and authors. Students also benefited from the revision process\textsuperscript{12} and developed critical thinking ability\textsuperscript{13} as a result of participating in an undergraduate journal.

Background of the Journal of Purdue Undergraduate Research

Purdue University is a large public land-grant research university in the Midwest United States. Purdue enrolls 39,000 students, 77\% of whom are undergraduates, and employs 1,800 tenured and tenure-track faculty (Data digest, 2012).\textsuperscript{14} The school is particularly strong in STEM (science, technology, engineering, and math) disciplines, with more than half of the students enrolled in majors in those areas. It ranks fourth among colleges and universities in total STEM degrees conferred.\textsuperscript{15}

The original idea for the creation of a journal of undergraduate research at Purdue came from a group of faculty members from around the university, convened in fall 2009 by Dr. Greg Michalski, an associate professor with dual appointments in the departments of earth, atmospheric, and planetary sciences (EAPS) and chemistry. These colleagues recognized that although Purdue undergraduates were involved in over 2,000 student research projects annually there were few opportunities to showcase their research. While an annual poster session organized by the Colleges of Science, Engineering, and Technology provided a short-term opportunity, when the posters came down there was little tangible record of student achievement. There were also two well-organized undergraduate research programs on campus that provided some coaching in the communication of research (the Discovery Park Undergraduate Research Internship program (DURI) and the Summer Undergraduate Research Fellowships (SURF) program in the College of Engineering), but most undergraduates lacked opportunities to carry their research through to a publication that would provide them with credit for their efforts. If their work was of a quality to be published in a disciplinary journal, the student would be one of a long list of authors and their particular contribution would be indiscernible to graduate schools or potential employers.

How to sustain a new publication was one of the central topics of discussion of the faculty group. An analysis of the list of undergraduate research journals on the Council for Undergraduate Research (CUR) website revealed that almost half of the 65 publications listed in 2009 either had broken links or displayed “current issues” over two years old. A consistent feature of the journals that were struggling was that they appeared to be entirely student run, with the inevitable problems of staff turnover, while successful and sustainable publications always had a permanent home within the institution, usually within a dedicated office of undergraduate research. Since Purdue’s model of undergraduate research administration was decentralized, with initiatives located at the college level, there seemed little opportunity of establishing a central office of undergraduate research. The group therefore looked for another institutional partner, and found one in the libraries.

Like an increasing number of academic libraries, Purdue University Libraries provides publishing
support services to its institutional community. In 2009, Purdue University Press had been moved into the libraries, and there was enthusiasm about exploring new relationships which could combine the publishing skills of the press with use of Purdue e-Pubs, the Digital Commons-based institutional repository platform that features powerful publishing features. Publishing an undergraduate research journal was particularly appealing because it connected the scholarly communication program of the libraries with strategic goals around information literacy (as noted by librarians at other institutions).16

The faculty group and libraries staff submitted a proposal to create the Journal of Purdue Undergraduate Research (JPUR) to the provost’s office in 2010. The support requested for a three year launch period was $30,000 per annum, primarily for the employment of a half-time undergraduate student journal coordinator and printing costs. It was felt that a handsome printed version of the journal would be an important companion to an open access online version so that student authors would have a tangible object to show potential graduate schools and employers and that the institution would be able to use it as a marketing piece to attract good candidates and interest donors. The detailed proposal covered aims, context, format, governance and staffing, budget, and timeline.

The provost, Dr. Timothy Sands, and the vice provost for undergraduate academic affairs, Dr. Dale Whittaker, were supportive of the initiative (and Dr. Whittaker agreed to serve as the journal’s continuing advisor). The initial funding was granted and has recently been renewed on a non-recurring annual basis. However, both Dr. Sands and Dr. Whittaker placed a strong emphasis on the need for the journal to include a robust assessment plan, which would assess the degree to which the publication of the journal contributed to the success of Purdue students. Purdue defines student success as an “increased rate of student degree completion, future employment or study, dedicated citizenship, and responsible leadership in the state, nation, and world.”17 Making a convincing link between the journal and student success was an unfamiliar challenge to the publishing staff, since journal impact is generally measured through usage or citation. The availability of expert help in creating an assessment tool in the person of the W. Wayne Booker chair of information literacy was therefore an early and important criterion for success.

Once funding was approved, work immediately began on the first issue. A faculty advisory board consisting of members of the original faculty group who had initiated the journal and colleagues from a broad spread of disciplines was established under the chairmanship of Dr. Michalski. The advisory board identified and implemented ways for the students to submit strong proposals and develop high quality papers. These included: a website populated with customized learning resources (“Policies” (http://docs.lib.purdue.edu/jpur/policies.html) and “Tips for Authors” (http://docs.lib.purdue.edu/jpur/tips_for_authors.html); “Writing Winning Proposals” seminars on preparing submissions; faculty reviewer feedback for students who submitted abstract proposals; writing development workshops for accepted authors; and peer mentors for each article author drawn from the journal’s student editorial board. Table 1 shows the characteristics of each volume including number of submissions, acceptance rates, number of articles and research snapshots published, and number of authors/co-authors.
Next, a student journal coordinator was selected and calls for proposals were sent. The Journal of Purdue Undergraduate Research (http://docs.lib.purdue.edu/jpur/) published its first annual volume in August 2011 with this stated purpose, which includes explicit ties to student success, as well as the promotional value of the journal:

...to further encourage the development of undergraduate research at Purdue by showcasing the best work in a tangible, centralized, and public way. JPUR will be of benefit to students, faculty, and administration:

- Student authors will benefit from experiencing the scholarly publishing process—from submission, through review and development, to formal publication. They will learn valuable lessons in scientific writing and publication ethics. Published articles will be tangible evidence of achievement, valuable for their future careers.
- Student editors will learn about the publishing process from behind the scenes, better preparing them to be the academic authors of the future.
- Faculty will be encouraged by the richness of undergraduate research activity in the University, and motivated to act as mentors. Working toward an end goal of publication, whether it is in JPUR or the journal of a disciplinary society, provides teaching moments to develop information literacy knowledge.
- For university administration, the journal will provide an undergraduate recruiting and retention device, K-12 outreach material, and a fundraising tool. JPUR will advertise Purdue as a place where undergraduates are involved with innovative research early and often.
- The professional electronic edition of the journal will reach global audiences (this impact will be tracked using usage analysis tools), strengthening Purdue’s ability to attract outstanding international students (http://docs.lib.purdue.edu/jpur/about.html).

JPUR publishes full-length articles, interviews, and editorials. It also publishes research snapshots, which are lengthy summaries of research. There are two annual deadlines for students to submit abstracts for consideration (currently November 15 and February 15). Purdue faculty who are experts in the topic of each submission provide reviews. The faculty advisory board then selects the articles and snapshots for inclusion. Peer
mentoring and developmental editing is handled by the student editorial board, led by the student journal coordinator (a role successively occupied by Paul Sliker, Richelle Wescott, Elizabeth Hudson, and Brooke Halteman). The student editors and authors are supported by writing workshops jointly organized by the libraries and the Purdue Writing Lab in the Department of English. While copyediting and design assistance is provided by the staff of Purdue University Press, the design of the journal over the last three years has been the work of undergraduate interns supervised by staff from Purdue Marketing and Media. The journal can thus reasonably claim to be not only student authored but also student produced, even though a partnership between the press/libraries, the Department of English, and Purdue Marketing and Media supports their efforts and ensures sustainability.

Assessment of the Journal of Purdue Undergraduate Research

Assessment produces data that can help in understanding what students learned and whether that learning aligned with the outcomes defined. Assessment can be “formative, meaning a process for exploration, revision, and improvement; and summative, meaning a process for determining merit and making administrative decisions about people or programs.”

There are few publications that describe the results of an assessment of an undergraduate research journal, while some authors have commented on future plans to assess the impact of their journals. This is clearly an area in which more work needs to be done. The publication of an undergraduate research journal requires resources, and data gathered through assessment can demonstrate whether a journal contributes to student success, and thus can help justify decisions about the priority of allocating resources to this activity.

Methods

Assessment Plan

The assessment plan for JPUR included formative and summative assessment based on the journal’s stated purpose. The plan included the following stakeholder groups:

- **Student authors of JPUR articles.** These students experienced a competitive and intensive period of writing with mentoring from a peer and a faculty member. The

The assessment methodology consisted of questionnaires for the stakeholder groups, workshop evaluations, and web metrics.
Online surveys were developed for each of the stakeholder groups and distributed annually to them after students submitted final versions of their papers. These were summative assessments in evaluating perceptions at the end of the publishing process. They were formative in providing data for continuous improvement of the journal. Participation in the writing of an article requires competence in information literacy, so many of the items in the surveys probed for gains in this area. The faculty advisory board received surveys only in 2011; university administrators will receive surveys at a later date. The Purdue Institutional Review Board approved the study as exempt. Appendix 1 consists of the e-mail messages and survey questions.

Students who attended the workshops were asked to complete evaluations. This was a formative assessment.

The use of web metrics from Google Analytics (http://www.google.com/analytics/) and Purdue’s e-Pubs institutional repository (http://docs.lib.purdue.edu/) downloads provided data relating to usage. Such metrics provide data about usage of online resources, providing an additional dimension for assessing impact, although not student success.23

Data were collected and reports compiled for three years from 2011–2013. Some changes to processes were made each year based on the results of the assessments. This paper focuses on student learning gains as a result of participating in JPUR.

Results
Table 2 shows that the response rates for student authors of accepted articles and snapshots ranged from 43% to 73%. The response rate for faculty mentors of student article and research snapshot authors ranged from 27% to 91%. The response rate for student editorial board members ranged from 22% to 100%. The faculty advisory board received surveys once in 2011, and the response rate was 58%. The following are the results of the assessments for each stakeholder group. (Note: Data for non-accepted student authors or their faculty mentors is not included due to low response rates and overall number of respondents in these categories).

Table 2. Survey Response Rates.

<table>
<thead>
<tr>
<th>Survey Recipient</th>
<th>2011 Response Rate (contacted/completed)</th>
<th>2012 Response Rate (contacted/completed)</th>
<th>2013 Response Rate (contacted/completed)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student authors of published articles</td>
<td>43% (7/3)</td>
<td>73% (11/8)</td>
<td>61% (18/11)</td>
<td>61% (36/22)</td>
</tr>
<tr>
<td>Student authors of research snapshots</td>
<td>N/A</td>
<td>50% (42/21)</td>
<td>65% (52/34)</td>
<td>59% (94/55)</td>
</tr>
<tr>
<td>Student authors of non-accepted abstracts</td>
<td>8% (25/2)</td>
<td>10% (21/2)</td>
<td>6% (17/1)</td>
<td>8% (63/5)</td>
</tr>
<tr>
<td>Student Editorial Board members</td>
<td>100% (5/5)</td>
<td>22% (9/2)</td>
<td>63% (8/5)</td>
<td>55% (22/12)</td>
</tr>
<tr>
<td>Faculty mentors of student authors</td>
<td>71% (7/5)</td>
<td>27% (11/3)</td>
<td>71% (17/12)</td>
<td>57% (35/20)</td>
</tr>
<tr>
<td>Faculty mentors of snapshot authors</td>
<td>N/A</td>
<td>63% (38/24)</td>
<td>91% (33/30)</td>
<td>76% (71/54)</td>
</tr>
<tr>
<td>Faculty mentors of students with non-accepted abstracts</td>
<td>13% (24/3)</td>
<td>23% (21/5)</td>
<td>N/A</td>
<td>18% (45/8)</td>
</tr>
</tbody>
</table>
Students
The student authors and members of the Student Editorial Board were asked whether they had gained in learning in specific areas as a result of writing for JPUR or mentoring a student author. Table 3 details the self-reported learning gains. Eight percent (n=1) to 94% (n=17) of the students reported some learning gains in each of the areas about which they were asked:

- How to write for professional publication
- How to write about research for an informed public audience
- The process for publishing an article
- How scholarly publication contributes to the research community
- How to identify and paraphrase the main ideas from an article or book
- How to synthesize information from multiple sources
- How to use evidence to draw conclusions
- How to support my points with evidence
- How to evaluate the credibility of authors of articles/books/reports
- When to cite other authors in a paper
- How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
- How to use a publication style manual to format papers or bibliographies
- How to construct spreadsheets, charts, or graphs to display information
- How to work collaboratively

Of all student groups surveyed (article authors, abstract authors, editorial board members), student article authors reported the most learning gains. Almost all of those students gained in understanding the process for publishing an article (n=17, 94%). The least gains in this group occurred in how to use a citation manager (n=6, 33%).

More than half of the research snapshot authors reported learning in all areas except:

- The process for publishing an article (n=26, 48%)
- How to construct spreadsheets, charts, or graphs to display information (n=26, 48%)
- How to use a citation manager (n=20, 37%)
- How to use a publication style manual to format papers or bibliographies (n=21, 39%)

The student editorial board members' primary gains (n=5, 42%) were in understanding the process for publishing an article and how to evaluate the credibility of authors. They gained least (n=1, 8%) in the areas of how to construct spreadsheets, charts, or graphs to display information and how to work collaboratively.


<table>
<thead>
<tr>
<th>Competency</th>
<th>Article Authors Reporting Gains (total respondents = 18)</th>
<th>Snapshot* Authors Reporting Gains (total respondents = 54)</th>
<th>Editorial Board Members Reporting Gains (total respondents = 12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to write for professional publication</td>
<td>13 (72%)</td>
<td>27 (50%)</td>
<td>2 (17%)</td>
</tr>
<tr>
<td>Competency</td>
<td>Article Authors Reporting Gains (total respondents = 18)</td>
<td>Snapshot* Authors Reporting Gains (total respondents = 54)</td>
<td>Editorial Board Members Reporting Gains (total respondents = 12)</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>-----------------------------------------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>How to write about research for an informed public audience</td>
<td>14 (78%)</td>
<td>31 (57%)</td>
<td>3 (25%)</td>
</tr>
<tr>
<td>The process for publishing an article</td>
<td>17 (94%)</td>
<td>26 (48%)</td>
<td>5 (42%)</td>
</tr>
<tr>
<td>How scholarly publication contributes to the research community</td>
<td>10 (56%)</td>
<td>29 (54%)</td>
<td>4 (33%)</td>
</tr>
<tr>
<td>How to identify and paraphrase the main ideas from an article or book</td>
<td>12 (67%)</td>
<td>29 (54%)</td>
<td>4 (33%)</td>
</tr>
<tr>
<td>How to synthesize information from multiple sources</td>
<td>9 (50%)</td>
<td>31 (57%)</td>
<td>2 (17%)</td>
</tr>
<tr>
<td>How to use evidence to draw conclusions</td>
<td>11 (61%)</td>
<td>28 (52%)</td>
<td>2 (17%)</td>
</tr>
<tr>
<td>How to support my points with evidence</td>
<td>11 (61%)</td>
<td>31 (57%)</td>
<td>3 (25%)</td>
</tr>
<tr>
<td>How to evaluate the credibility of authors of articles/books/reports</td>
<td>11 (61%)</td>
<td>30 (56%)</td>
<td>5 (42%)</td>
</tr>
<tr>
<td>When to cite other authors in a paper</td>
<td>9 (50%)</td>
<td>25 (46%)</td>
<td>1 (8%)</td>
</tr>
<tr>
<td>How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies</td>
<td>6 (33%)</td>
<td>20 (37%)</td>
<td>4 (33%)</td>
</tr>
<tr>
<td>How to use a publication style manual to format papers or bibliographies</td>
<td>9 (50%)</td>
<td>21 (39%)</td>
<td>4 (33%)</td>
</tr>
<tr>
<td>How to construct spreadsheets, charts, or graphs to display information</td>
<td>9 (50%)</td>
<td>26 (48%)</td>
<td>1 (8%)</td>
</tr>
</tbody>
</table>
The student article authors were asked about techniques they learned to find articles and other sources for their literature reviews by writing an article for JPUR. Most of the students learned how to broaden or narrow their search topic (n=14, 64%) and how to retrieve the full text of journal articles (n=13, 59%). Fewer learned to set Google Scholar preferences to search for articles available through the Purdue Libraries (n=6, 27%); about databases of citations to articles about their subject (n=5, 23%); and about the libraries’ interlibrary loan service (n=3, 14%).

To triangulate the self-reports of learning by student authors, the faculty, student editorial board mentors, and faculty advisory board members were asked whether they believed that student authors gained a better understanding of the same areas as a result of writing an article for JPUR. Table 4 shows that most of the faculty mentor respondents perceived that the students learned in all areas, except how to use a citation manager (n=7, 35%). Most of the student editorial board members perceived that the authors learned in all areas. Most of the faculty mentors of authors of research snapshots perceived that the students learned in all areas except how to use a publication style manual to format papers or bibliographies (n=26, 48%) and how to use a citation manager (n=16, 30%).
Table 4. Percentage of Faculty and Student Mentors (2011–2013) and Faculty Advisory Board Members (2011) Who Perceived Some or Sufficient Student Author Learning Gains during the Process of Writing an Article for JPUR.

<table>
<thead>
<tr>
<th>Competency</th>
<th>Faculty Mentors of Article Authors (total respondents=20)</th>
<th>Student Mentors (total respondents = 12)</th>
<th>Faculty Mentors of Snapshot Authors (total respondents = 54)</th>
<th>Faculty Advisory Board* (total respondents = 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to write for professional publication</td>
<td>18 (90%)</td>
<td>12 (100%)</td>
<td>45 (83%)</td>
<td>7 (100%)</td>
</tr>
<tr>
<td>How to write about research for an informed public audience</td>
<td>18 (90%)</td>
<td>12 (100%)</td>
<td>51 (94%)</td>
<td>7 (100%)</td>
</tr>
<tr>
<td>The process for publishing an article</td>
<td>17 (85%)</td>
<td>11 (92%)</td>
<td>32 (59%)</td>
<td>7 (100%)</td>
</tr>
<tr>
<td>How scholarly publication contributes to the research community</td>
<td>14 (70%)</td>
<td>11 (92%)</td>
<td>41 (76%)</td>
<td>6 (86%)</td>
</tr>
<tr>
<td>How to identify and paraphrase the main ideas from an article or book</td>
<td>14 (70%)</td>
<td>11 (92%)</td>
<td>45 (83%)</td>
<td>6 (86%)</td>
</tr>
<tr>
<td>How to synthesize information from multiple sources</td>
<td>17 (85%)</td>
<td>11 (92%)</td>
<td>41 (76%)</td>
<td>7 (100%)</td>
</tr>
<tr>
<td>How to use evidence to draw conclusions</td>
<td>18 (90%)</td>
<td>11 (92%)</td>
<td>44 (81%)</td>
<td>7 (100%)</td>
</tr>
<tr>
<td>How to support their points with evidence</td>
<td>16 (80%)</td>
<td>11 (92%)</td>
<td>43 (80%)</td>
<td>7 (100%)</td>
</tr>
<tr>
<td>How to evaluate the credibility of authors of articles/books/reports</td>
<td>13 (65%)</td>
<td>12 (100%)</td>
<td>29 (54%)</td>
<td>6 (86%)</td>
</tr>
<tr>
<td>When to cite other authors in a paper</td>
<td>16 (80%)</td>
<td>12 (100%)</td>
<td>31 (57%)</td>
<td>7 (100%)</td>
</tr>
</tbody>
</table>
Table 5. Student Authors 2011–2013 Who Used Resources and Found Them Helpful or Somewhat Helpful.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Article Authors Found Helpful</th>
<th>Snapshot Authors Found Helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty mentor</td>
<td>21 (95%)</td>
<td>51 (93%)</td>
</tr>
<tr>
<td>Student mentor (Editorial Board member)</td>
<td>19 (86%)</td>
<td>No data</td>
</tr>
</tbody>
</table>
The student article authors could select multiple reasons when asked why they decided to write an article for JPUR. The most frequently cited reason was to be more competitive as a graduate school applicant (n=16, 73%). Other reasons were to be more appealing to future potential employers (n=13, 59%); because they enjoyed conducting and writing scholarly research (n=11, 50%); and because their faculty mentor encouraged them to do so (n=10, 45%).

When asked whether they would consider publishing articles in the future, all but one of the article authors (n=21, 95%) indicated that they intended to publish at least one scholarly article as a result of preparing an article for JPUR. Almost half of the snapshot authors (n=35, 46%) intended to publish again. This finding agrees with Walkington’s analysis.24

Around 20% of the article authors (n=5; 23%) and snapshot authors (n=15, 20%) decided to pursue a career in research in her/his field of study as a result of writing an article for JPUR.

As a result of serving as an editorial board member, all of the students (n=12) reported that they learned that they enjoyed scholarly writing. Most of them learned that they enjoyed editorial work (n=11, 92%) and teaching (n=8, 67%). A student commented:

“It was an amazing experience and it allowed me to get a taste for what I would be doing when I graduated college. It was a step in the right direction for me professional experience-wise and I am much better because of it.”

Faculty Mentors
More than half of the faculty mentors responded to the surveys. Most of the faculty mentors of article (n=17, 85%) and snapshot (n=44, 81%) authors responded that they would mentor a student who wanted to publish an article in JPUR again. Two comments were:

This experience enhances their skills and makes them more valuable to potential employers.

It is rewarding to work with undergraduates who are enthusiastic about research. It is also a nice way to identify potential graduate students to study in our department.

Web Metrics
Between October 1, 2011 and September 1, 2013, JPUR received 13,980 total visits, 10,581 unique visitors, and 24,887 page views. Most of the total visits (86%, n=12,009) originated in the US; other countries represented less than 2% each of the visits.

JPUR articles were deposited in the Purdue institutional repository. Purdue e-Pubs (http://docs.lib.purdue.edu/). COUNTER-compliant statistics show that articles were downloaded from e-Pubs 13,739 times between October 1, 2011 and September 1, 2013.

JPUR articles are allocated DOIs on publication. An innovation in 2013 was to add an altmetric.com button to each article to track mentions through social media and on the open web; however, it is too early to see substantial impact.
Discussion
Since 2011, one hundred and forty-two students have authored or co-authored articles or research snapshots for JPUR. An additional twenty-nine students were members of the student editorial board and mentored student authors. The results of the assessment presented here demonstrate that, for these students, JPUR has had a positive impact on their current and future success.

Connecting to “Success”
It is clear from the student and faculty feedback, and the journal’s metrics, that JPUR is fulfilling several aspects of its stated purpose (as articulated earlier):
• JPUR publicly and centrally showcases the work of undergraduate students.
• Student authors benefit from experiencing the full spectrum of the scholarly publishing process and learn about scientific writing and publication ethics.
• Students have developed important information literacy competencies.
• The journal is reaching a global audience (http://docs.lib.purdue.edu/jpur/about.html).

Importantly, the assessment data also directly address “success” as defined by Purdue (and the provost): an “increased rate of student degree completion, future employment or study, dedicated citizenship, and responsible leadership in the state, nation, and world.” Not only did 20% of the student article authors indicate a desire to pursue a career in research in their respective fields of study as a result of writing an article for JPUR, but the learning gains reported by student authors indicate that those students will be better prepared for “future employment or study” in their fields as well. Students’ interest in publishing again (all but one of the article authors and half of the snapshot authors would consider publishing articles in the future) is also a positive indicator for their future involvement and leadership within their disciplines.

JPUR and Information Literacy
An important component in preparing students for future success—and one which is directly addressed by JPUR—is building student competence in finding and using information (information literacy). The American Association of Colleges & Universities identifies information literacy as an essential learning outcome for undergraduate students (http://www.aacu.org/leap/vision.cfm), and at Purdue, information literacy is one of the expected core learning outcomes for undergraduate students. Since writing a paper for publication involves many distinct information literacy competencies, JPUR directly addresses several important areas for student learning (e.g., how to synthesize information, how to use evidence to draw conclusions, how to evaluate the credibility of authors, how to properly cite others’ work, et al.). The assessment of JPUR shows that students gained in learning (and in information literacy competency) as a result of writing an article for JPUR. Student article authors reported the most gains, conceivably because they had the most involvement with the article writing process.

Connecting core information literacy competencies to learning gains achieved through participation in JPUR is significant because both the ability to use information and to communicate effectively in writing are expected of students by higher education accreditation agencies (organizations that define expected college study learning outcomes) and by employers. For example, many colleges accredited by the Southern Association of Colleges and Universities have prepared institution-wide improvement plans focused on information literacy (see http://libguides.trinity.edu/qep), and recent studies of employers indicate that new graduates and employees in general need, but lack, competency in written communication. Student involvement in JPUR can demonstrate student achievement of these skills to both accreditors and future employers.

Areas for Further Emphasis
While the students who wrote for JPUR gained an experiential understanding of how to communicate professionally with others in their discipline, there were some areas identified through the assessment in which learning gains were not as strong as hoped. Less learning occurred in how to use a citation manager; in how to set Google Scholar preferences; how to access specialist databases in their subject of inquiry; and about the interlibrary loan service. This raises questions about how the students found citations for their articles, whether they did thorough searches, and whether and how they obtained full text for those articles not available through the university libraries. Discussion with the student authors while they are writing their papers could provide further insight.
into this, and further training about the mechanics of using library platforms may be needed.

In addition, although the student editorial board members gained in learning in areas related to their mentoring responsibilities (understanding the process for publishing an article and evaluating author credibility), it is interesting to note that they felt they gained least in how to work collaboratively—a seemingly essential skill for their role and a characteristic of research groups that is important for undergraduate researchers to understand. This finding is also contrary to the findings about student staff of another undergraduate research journal: “learning to work with others’ was one of the most frequently mentioned talents [student] staff took away from their time with PennScience.” However, PennScience is a student-run journal that developed a team-based model for its organizational structure and its emphasis on teamwork may explain the difference in findings. Further exploration would reveal whether the students involved with JPUR will need additional training in this area.

Collaborating for Student Success
The collaboration and investment of the time and resources of the provost, university press and libraries, faculty advisory board, Department of English, Purdue Marketing and Media, and faculty mentors resulted in influencing the learning and lives of the students involved. This intra-institutional cooperation demonstrates the importance of leveraging the strengths of multiple stakeholders in service of student learning. Clearly, the success of JPUR (and its student participants) has been enhanced by each group’s participation, whether in the journal itself or in its learning support activities (workshops, mentoring, and web resources). For example, the libraries’ central location within Purdue, its promotion of scholarly communication and information literacy, and its knowledge of scholarly publishing (supported by the positioning of Purdue University Press as an integral part of the libraries) have provided a logical home for the production of the journal. The libraries’ organizational support provides an ideal foundation for the stability of JPUR, ensures its continued professionalism, and allows faculty mentors and the faculty advisory board to focus on student learning.

Recommendations for Other Institutions
For the community of library publishers who are investing in publishing undergraduate research, the JPUR model provides a strong example of the benefit of such initiatives—as well as a method of gathering much needed assessment data for funders and administrators. Other institutions that are considering the establishment of an undergraduate research journal or that want to assess the student learning associated with one already established should consider these recommendations:

1. **Engage all of the relevant stakeholder groups** in the process of writing, mentoring, and decision making. The response rate for the surveys of more than 50% for most categories of stakeholders, which is considered good for social sciences research, is an indication of their commitment and engagement.

2. **Identify specifically what the students should learn** as a result of participating in the journal. This will very likely include information literacy competencies. This can be the basis for developing instruments that measure student learning outcomes.

3. **Plan learning resources** that will help the journal achieve its outcomes. Those resources can be people (mentors), formal learning situations (workshops), or objects (instructions, guides, tutorials, and lectures linked to the journal website).

4. **Use assessment data** to determine which learning resources to make available. The student editorial board learned least about how to construct spreadsheets, charts, or graphs to display information and how to work collaboratively, so these may be areas that need reinforcement.

5. **Consider the timing of the schedule of publication and distribution of the assessment instruments** carefully to maximize response rates.

6. **Advertise the advantages** of publishing in the journal as incentives to students to submit abstracts/proposals. The primary reason that student authors decided to write for JPUR was to be more competitive in applying to graduate school.

Conclusion
Undergraduate research is an educational experience that has a positive influence on learning and documenting the results of that research through a published paper. It further reinforces
learning and “closes the loop” of the scholarly communication process for students. As one Purdue faculty member commented, with regard to the value of the journal in teaching a holistic approach to communicating research, “JPUR has a slightly different writing style, which allowed me to tone it back a bit with my student in terms of the high end scholarly writing and really just focus on analyzing data and synthesizing the findings into a comprehensive and tight piece. It was more about the complete process.” Participating in the scholarly publication process can not only provide demonstrable learning gains for students, but can also influence their choice of career and decisions to write scholarly articles in the future. Faculty and student mentoring, workshops, and online learning resources (as provided at Purdue) can support students during this process and help improve learning.

While it is easy to state that student learning is the goal for an undergraduate journal, it is important to have a well-planned assessment strategy that can confirm that the journal is actually accomplishing this purpose. Particularly for library-publishing journals, it is important (and useful) to connect any assessment with information literacy competencies, as the staff of JPUR have done at Purdue. This will not only help connect the journal to the library’s strategic plan, but it can also help demonstrate student achievement in these areas to administrators. At Purdue, JPUR staff have made annual presentations to the provost’s leadership group (which includes senior staff from the office of the provost as well as deans of the colleges), using assessment results to show the impact of the journal (and to seek continued assistance from these academic leaders in recruiting proposals for the next year).

**Next Steps for JPUR**

To assure continued support for, and improvement of, JPUR, the annual assessment of student learning related to participating in the journal, faculty and peer mentoring, and workshops will continue. As a result of the assessment data shared in this paper, JPUR staff will add links to additional learning resources on the journal website. These resources will address areas where student learning gains were lower than expected: using a citation manager; constructing spreadsheets, charts, and graphs to display information; setting Google Scholar preferences to search for articles available through the Purdue Libraries; and strategies for working collaboratively. Links to subject-based citation databases and interlibrary loan services will also be added. Finally, to address emergent areas in scholarly communication, JPUR staff plan to expand the training offered to student authors to include discussion of research data management and further exploration of the importance of author rights.

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**Notes**


2. Ibid.


8. CUR: Council on Undergraduate Research, Undergraduate Journals, http://www.cur.org/resources/students/undergraduate_journals/.


22. Burks, et al.


24. Walkington, et al.


26. About student success at Purdue, [http://www.purdue.edu/studentsuccess/about.html](http://www.purdue.edu/studentsuccess/about.html).


30. Walkington, et al.

**References**

Appendix 1. JPUR Assessment E-mail Messages and Survey Questions for Each Stakeholder Group.

INITIAL CONTACT E-MAIL TO POTENTIAL PARTICIPANTS; SURVEY QUESTIONS

STUDENT AUTHORS

Initial Contact E-mail
‘We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As the author of one of the articles selected, your experience is very important to us! Please take a few minutes to respond to eight important questions. This is the link to the anonymous online survey: [SURVEY LINK]
The deadline for responding is ____. Thank you, in advance, for providing us with your perspective!
Sincerely,
Charles Watkinson
Director, Purdue University Press
Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy’
THE SURVEY
As the author of one of the articles selected for JPUR, your experience is very important to us!

1. BEFORE I WROTE AN ARTICLE for JPUR, I would rate my understanding of each of the following skills as:
   [Options Include ___ None ___ Very little ___ Some ___ Sufficient]
   ___ How to write for professional publication
   ___ How to write about research for an informed public audience
   ___ The process for publishing an article
   ___ How scholarly publication contributes to the research community
   ___ How to identify and paraphrase the main ideas from an article or book
   ___ How to synthesize information from multiple sources
   ___ How to use evidence to draw conclusions
   ___ How to support my points with evidence
   ___ How to evaluate the credibility of authors of articles/books/reports
   ___ When to cite other authors in a paper
   ___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
   ___ How to use a publication style manual to format papers or bibliographies
   ___ How to construct spreadsheets, charts, or graphs to display information
   ___ How to work collaboratively

2. AS A RESULT OF WRITING AN ARTICLE for JPUR, I would rate my current understanding of each of the following skills as:
   [Options Include ___ None ___ Very little ___ Some ___ Sufficient]
   ___ How to write for professional publication
   ___ How to write about research for an informed public audience
   ___ The process for publishing an article
   ___ How scholarly publication contributes to the research community
   ___ How to identify and paraphrase the main ideas from an article or book
   ___ How to synthesize information from multiple sources
   ___ How to use evidence to draw conclusions
   ___ How to support my points with evidence
   ___ How to evaluate the credibility of authors of articles/books/reports
   ___ When to cite other authors in a paper
   ___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
   ___ How to use a publication style manual to format papers or bibliographies
How to construct spreadsheets, charts, or graphs to display information
How to work collaboratively

3. How helpful were the following resources in helping you learn to write your article?
[Options Include  ____ Didn’t use  ____ Used but not helpful
  ____ Used and somewhat helpful  ____ Used and was very helpful]

  ____ Faculty Mentor
  ____ Student Editorial Board
  ____ Workshop: ‘Abstracts to Articles: Preparing Your Article for JPUR—Part 1’
    ([workshop date])
  ____ Workshop: ‘Abstracts to Articles: Preparing Your Article for JPUR—Part 2’
    ([workshop date])
  ____ JPUR Website
  ____ Purdue’s Online Writing Lab (OWL)
4. Please indicate how the process of writing an article for JPUR influenced decisions about your career.

___ As a result of writing an article for JPUR, I decided to pursue a career in research in my field of study.
___ As a result of writing an article for JPUR, I decided to pursue a career in research in a different field of study.
___ As a result of writing an article for JPUR, I decided not to pursue a career in research.
___ Writing an article for JPUR did not influence my career decisions.

5. What techniques did you learn about finding articles and other sources for your literature review by writing an article for JPUR? (Check all that apply)

___ I learned about databases of citations to articles about my subject (examples are: Academic Search Premier, ProQuest, BIOSIS, CAB, ERIC)
___ I learned how to retrieve the full text of journal articles
___ I learned how to broaden or narrow my search topic
___ I learned about the Libraries’ Interlibrary Loan service

6. How did you find out about JPUR?

___ From a professor
___ From an e-mail announcement about JPUR
___ From another student
___ From a presentation by JPUR staff
___ From a leaflet or postcard
___ From the SURF program staff
___ From the DURI program staff
___ Other [please specify]

7. Which factors contributed to your decision to write an article for JPUR? (Check all that apply)

___ I wanted to be more competitive as a graduate school applicant.
___ I wanted to be more appealing to future potential employers.
___ I wanted to work more closely with a faculty mentor.
___ My faculty mentor encouraged me to do so.
___ I enjoy conducting and writing scholarly research.

8. As a result of preparing an article for JPUR, how would you describe your attitude regarding publishing articles in the future?

___ I do not intend to publish scholarly articles in the future.
___ I have not decided whether I will publish scholarly articles in the future.
___ I intend to publish at least one scholarly article in the future.
9. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?
   ___ Yes, JPUR may use my comments.
   ___ No, JPUR may not use my comments.

‘Thank you for your participation in helping us to assess the Journal of Purdue Undergraduate Research. Please send an e-mail to [contact name] at [contact e-mail address] with the Subject Line: JPUR Follow-up if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].’
STUDENT EDITORIAL BOARD MENTORS

Initial Contact E-mail

‘We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As a member of the student editorial board, your experience is very important to us! Please take a few minutes to respond to six important questions. This is the link to the anonymous online survey:
[SURVEY LINK]
The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!
Sincerely,
Charles Watkinson
Director, Purdue University Press
Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy’
THE SURVEY
As a member of the student editorial board for JPUR, your experience is very important to us!

1. BEFORE I MENTORED A STUDENT in preparing an article for JPUR, I would rate my understanding of each of the following skills as:
   [Options Include None Very little Some Sufficient]

   _ How to write for professional publication
   _ How to write about research for an informed public audience
   _ The process for publishing an article
   _ How scholarly publication contributes to the research community
   _ How to identify and paraphrase the main ideas from an article or book
   _ How to synthesize information from multiple sources
   _ How to use evidence to draw conclusions
   _ How to support my points with evidence
   _ How to evaluate the credibility of authors of articles/books/reports
   _ When to cite other authors in a paper
   _ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
   _ How to use a publication style manual to format papers or bibliographies
   _ How to construct spreadsheets, charts, or graphs to display information
   _ How to work collaboratively

2. AS A RESULT OF MENTORING A STUDENT to prepare an article for JPUR, I would rate my current understanding of each of the following skills as:
   [Options Include None Very little Some Sufficient]

   _ How to write for professional publication
   _ How to write about research for an informed public audience
   _ The process for publishing an article
   _ How scholarly publication contributes to the research community
   _ How to identify and paraphrase the main ideas from an article or book
   _ How to synthesize information from multiple sources
   _ How to use evidence to draw conclusions
   _ How to support my points with evidence
   _ How to evaluate the credibility of authors of articles/books/reports
   _ When to cite other authors in a paper
   _ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
3. Do you believe that THE STUDENT AUTHOR(s) with whom you worked gained a better understanding of the following areas as a result of writing an article for JPUR?

[Options Include None Very little Some Sufficient]

- How to write for professional publication
- How to write about research for an informed public audience
- The process for publishing an article
- How scholarly publication contributes to the research community
- How to identify and paraphrase the main ideas from an article or book
- How to synthesize information from multiple sources
- How to use evidence to draw conclusions
- How to support my points with evidence
- How to evaluate the credibility of authors of articles/books/reports
- When to cite other authors in a paper
- How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
- How to use a publication style manual to format papers or bibliographies
- How to construct spreadsheets, charts, or graphs to display information
- How to work collaboratively

4. In what ways has the experience of serving as an editorial board member influenced you? (Check all that apply)

- I have learned that I enjoy teaching.
- I have learned that I do not enjoy teaching.
- I have learned that I enjoy editorial work.
- I have learned that I do not enjoy editorial work.
- I have learned that I enjoy scholarly writing.
- I have learned that I do not enjoy scholarly writing.

[Essay text box]

5. If given the opportunity, would you like to edit an article for JPUR again?

- Yes
- Maybe
- No
6. How did you find out about JPUR?
   ___ From a professor
   ___ From an e-mail announcement about JPUR
   ___ From another student
   ___ From a presentation by JPUR staff
   ___ From a leaflet or postcard
   ___ From the SURF program staff
   ___ From the DURI program staff
   ___ Other [please specify]

7. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?
   ___ Yes, JPUR may use my comments.
   ___ No, JPUR may not use my comments.

‘Thank you for your participation in helping us to assess the Journal of Purdue Undergraduate Research. Please send an e-mail to [contact name] at [contact e-mail address] with the Subject Line: JPUR Follow-up if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].’
FACULTY MENTORS

Initial Contact E-mail

‘We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As a mentor for a student whose article was selected, your experience is very important to us! Please take a few minutes to respond to four important questions. This is the link to the anonymous online survey:
[SURVEY LINK]
The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!
Sincerely,
Charles Watkinson
Director, Purdue University Press
Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy’
THE SURVEY
As a mentor for a student whose article was selected, your experience is very important to us!

1. Do you think that the student author(s) with whom you worked gained a better understanding of these areas during the process of writing an article for the Journal of Purdue Undergraduate Research (JPUR)?
   [Options
   Include    ___ None    ___ Very little    ___ Some    ___ Sufficient]
   ___ How to write for professional publication
   ___ How to write about research for an informed public audience
   ___ The process for publishing an article
   ___ How scholarly publication contributes to the research community
   ___ How to identify and paraphrase the main ideas from an article or book
   ___ How to synthesize information from multiple sources
   ___ How to use evidence to draw conclusions
   ___ How to support my points with evidence
   ___ How to evaluate the credibility of authors of articles/books/reports
   ___ When to cite other authors in a paper
     How to use a citation manager (such as Zotero, EndNote, or Reference Manager)
     to record and format citations for bibliographies
   ___ How to use a publication style manual to format papers or bibliographies
   ___ How to construct spreadsheets, charts, or graphs to display information
   ___ How to work collaboratively

2. How do you think having an article published in JPUR will influence the decisions of graduate school admissions personnel?
   ___ Negative Influence
   ___ No Influence
   ___ Favorable Influence

3. Would you mentor a student who wanted to publish an article in JPUR again?
   ___ Yes
   ___ Maybe
   ___ No
   [If yes, ask ‘Why?’
    If no, ask ‘Why not?’]
   [Essay text box]

4. What comments do you have regarding mentoring a student author in publishing for JPUR? You may want to comment on the time commitment; skills the student needed to develop; or the advantages or disadvantages of mentoring an undergraduate author.
   [Essay text box]
5. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?
   ___ Yes, JPUR may use my comments.
   ___ No, JPUR may not use my comments.

'Thank you for your participation in helping us to assess the Journal of Purdue Undergraduate Research. Please send an e-mail to [contact name] at [e-mail address] with the Subject Line: JPUR Follow-up if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].'
STUDENTS WHO SUBMITTED ABSTRACTS THAT WERE NOT ACCEPTED

Initial Contact E-mail

‘We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). You have gone through the process of writing an abstract and submitting it for consideration by JPUR. Your experience is very important to us! Please take a few minutes to respond to eight important questions. This is the link to the anonymous online survey:

[SURVEY LINK]

The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!

Sincerely,

Charles Watkinson
Director, Purdue University Press

Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy’
THE SURVEY
You have gone through the process of writing an abstract and submitting it for consideration by JPUR. We would like to ask you about what you might have learned through this process.

1. What techniques did you learn about finding articles and other sources for your literature review by writing an abstract for JPUR? (Check all that apply)
   - I learned about databases of citations to articles about my subject (examples are: Academic Search Premier, ProQuest, BIOSIS, CAB, ERIC)
   - I learned how to retrieve the full text of journal articles
   - I learned to set Google Scholar preferences to search for articles available through Purdue Libraries
   - I learned how to broaden or narrow my search topic
   - I learned about the Libraries’ Interlibrary Loan service

2. BEFORE I WROTE AN ABSTRACT for JPUR, I would rate my understanding of each of the following skills as:
   [Options Include ___ None ___ Very little ___ Some ___ Sufficient]
   - How to write for professional publication
   - How to write about research for an informed public audience
   - The process for publishing an article
   - How scholarly publication contributes to the research community
   - How to identify and paraphrase the main ideas from an article or book
   - How to synthesize information from multiple sources
   - How to use evidence to draw conclusions
   - How to support my points with evidence
   - How to evaluate the credibility of authors of articles/books/reports
   - When to cite other authors in a paper
   - How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
   - How to use a publication style manual to format papers or bibliographies
   - How to construct spreadsheets, charts, or graphs to display information
   - How to work collaboratively
3. AS A RESULT OF WRITING AN ABSTRACT for JPUR, I would rate my current understanding of each of the following skills as:

[Options Include ___ None ___ Very little ___ Some ___ Sufficient]

___ How to write for professional publication
___ How to write about research for an informed public audience
___ The process for publishing an article
___ How scholarly publication contributes to the research community
___ How to identify and paraphrase the main ideas from an article or book
___ How to synthesize information from multiple sources
___ How to use evidence to draw conclusions
___ How to support my points with evidence
___ How to evaluate the credibility of authors of articles/books/reports
___ When to cite other authors in a paper
   How to use a citation manager (such as Zotero, EndNote, or Reference Manager)
   to record and format citations for bibliographies
___ How to use a publication style manual to format papers or bibliographies
___ How to construct spreadsheets, charts, or graphs to display information
___ How to work collaboratively

4. How helpful were the following resources in helping you learn to write your abstract?
   ___ Faculty Mentor
   ___ JPUR Website
   ___ Purdue’s Online Writing Lab (OWL)

[Options Include ___ Didn’t use ___ Used but not helpful ___ Used and somewhat helpful ___ Used and was very helpful]

5. Please indicate how the process of writing an abstract for JPUR influenced decisions about your career.

   As a result of writing an abstract for JPUR, I decided to pursue a career in research in my field of study.
   ___
   As a result of writing an abstract for JPUR, I decided to pursue a career in research in a different field of study.
   ___
   As a result of writing an abstract for JPUR, I decided not to pursue a career in research.
   ___
   Writing an abstract for JPUR did not influence my career decisions.
   ___
6. How did you find out about JPUR?
   ___ From a professor
   ___ From an e-mail announcement about JPUR
   ___ From another student
   ___ From a presentation by JPUR staff
   ___ From a leaflet or postcard
   ___ From the SURF program staff
   ___ From the DURI program staff
   ___ Other [please specify]

7. Which factors contributed to your decision to write an abstract for JPUR? (Check all that apply)
   ___ I wanted to be more competitive as a graduate school applicant.
   ___ I wanted to be more appealing to future potential employers.
   ___ I wanted to work more closely with a faculty mentor.
   ___ My faculty mentor encouraged me to do so.
   ___ I enjoy conducting and writing scholarly research.

8. As a result of preparing an abstract for JPUR, how would you describe your attitude regarding publishing articles in the future?
   ___ I do not intend to publish scholarly articles in the future.
   ___ I have not decided whether I will publish scholarly articles in the future.
   ___ I intend to publish at least one scholarly article in the future.

9. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?
   ___ Yes, JPUR may use my comments.
   ___ No, JPUR may not use my comments.

‘Thank you for your participation in helping us to assess the Journal of Purdue Undergraduate Research. Please send an e-mail to [name] at [e-mail address] with the Subject Line: JPUR Follow-up if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].’
FACULTY WHO MENTORED STUDENTS WHOSE ABSTRACTS WERE NOT ACCEPTED

Initial Contact E-mail
‘We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As a mentor for a student who submitted an abstract, your experience is very important to us! Please take a few minutes to respond to four important questions. This is the link to the anonymous online survey:
[SURVEY LINK]
The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!
Sincerely,
Charles Watkinson
Director, Purdue University Press
Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy’
THE SURVEY
As a mentor for a student who submitted an abstract, your experience is very important to us!

1. Do you think that the student author(s) with whom you worked gained a better understanding of these areas during the process of writing an abstract for the Journal of Purdue Undergraduate Research (JPUR)?

[Options Include  ____ None  ____ Very little  ____ Some  ____ Sufficient]

____ How to write for professional publication
____ How to write about research for an informed public audience
____ The process for publishing an article
____ How scholarly publication contributes to the research community
____ How to identify and paraphrase the main ideas from an article or book
____ How to synthesize information from multiple sources
____ How to use evidence to draw conclusions
____ How to support my points with evidence
____ How to evaluate the credibility of authors of articles/books/reports
____ When to cite other authors in a paper
____ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
____ How to use a publication style manual to format papers or bibliographies
____ How to construct spreadsheets, charts, or graphs to display information
____ How to work collaboratively

2. How do you think having an article published in JPUR will influence the decisions of graduate school admissions personnel?

____ Negative Influence
____ No Influence
____ Favorable Influence

3. Would you mentor a student who wanted to submit an abstract to JPUR again?

____ Yes
____ Maybe
____ No

[If no, ask ‘Why not?’
If yes, ask ‘Why?’]

[Essay text box]
4. What comments do you have regarding mentoring a student author in publishing for JPUR?
[Essay text box]

5. Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?
___ Yes, JPUR may use my comments.
___ No, JPUR may not use my comments.

‘Thank you for your participation in helping us to assess the Journal of Purdue Undergraduate Research. Please send an e-mail to [name] at [e-mail address] with the Subject Line: JPUR Follow-up if you would like to provide any additional information about your experience or the journal, or if you would like information regarding JPUR [the following year].’
FACULTY ADVISORY BOARD

Initial Contact E-mail

‘We are conducting an assessment of the Journal of Purdue Undergraduate Research (JPUR). As a member of the Faculty Advisory Board, your experience is very important to us! Please take a few minutes to respond to four important questions. This is the link to the anonymous online survey:
[SURVEY LINK]
The deadline for responding is [date]. Thank you, in advance, for providing us with your perspective!
Sincerely,
Charles Watkinson
Director, Purdue University Press
Sharon Weiner
Professor and W. Wayne Booker Chair in Information Literacy’
THE SURVEY
As a member of the Faculty Advisory Board, your experience with JPUR is very important to us!

1. Do you think that student authors whose papers were published in the inaugural issue of Journal of Purdue Undergraduate Research (JPUR) gained a better understanding about these areas during the writing process?
   [Options Include ___ None ___ Very little ___ Some ___ Sufficient]

   ___ How to write for professional publication
   ___ How to write about research for an informed public audience
   ___ The process for publishing an article
   ___ How scholarly publication contributes to the research community
   ___ How to identify and paraphrase the main ideas from an article or book
   ___ How to synthesize information from multiple sources
   ___ How to use evidence to draw conclusions
   ___ How to support my points with evidence
   ___ How to evaluate the credibility of authors of articles/books/reports
   ___ When to cite other authors in a paper
   ___ How to use a citation manager (such as Zotero, EndNote, or Reference Manager) to record and format citations for bibliographies
   ___ How to use a publication style manual to format papers or bibliographies
   ___ How to construct spreadsheets, charts, or graphs to display information
   ___ How to work collaboratively

2. How do you think the publication of an article in JPUR might influence the decisions of graduate school admissions personnel?
   ___ Negative Influence
   ___ No Influence
   ___ Favorable Influence

3. Would you encourage students to submit an article for publication in JPUR?
   ___ Yes
   ___ Maybe
   ___ No

   [If yes, ask ‘Why?’
   If no, ask ‘Why not?’]

   [Essay text box]
4. **What other comments do you have regarding JPUR?**
   [Essay text box]

5. **Are you willing to allow JPUR to anonymously use comments you provided in this survey to help promote the journal?**
   ___ Yes, JPUR may use my comments.
   ___ No, JPUR may not use my comments.

‘Thank you for your participation in helping us to assess the *Journal of Purdue Undergraduate Research*. Please send an e-mail to [name] at [e-mail address] with the Subject Line: *JPUR Follow-up* if you would like to provide any additional information about your experience or the journal, or if you would like information regarding *JPUR* [the following year].’
Assessment in Action: Multifaceted Collaboration

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Abstract
Academic librarians are connecting with campus partners in novel ways to question and discover how they bring value to their institutions. To foster these partnerships, the Association of College and Research Libraries (ACRL), with funding from the US Institute of Museum and Library Services, launched the three-year program “Assessment in Action: Academic Libraries and Student Success” (AiA) to help hundreds of postsecondary institutions of all types develop campus partnerships that create the engaged library of the future. Its design is based on input from two invitational summits initiated in response to recommendations to build librarians’ capacity in this area. Each selected institution has a team with a librarian and at least two people from other campus units. The librarians are participating in a formal 14-month professional development program and are leading their campus teams in developing and implementing action-learning projects which examine the impact of the library on student learning and success.

The action-learning projects consider different aspects of the academic library and their relationship to student learning and/or success. This paper presents a preliminary review and synthesis of project reports from the first 75 institutions to participate from April 2013–June 2014. Individual project reports will be disseminated in fall 2014, along with a summary report, for use by the wider academic library and higher education communities. This paper briefly describes the AiA program and then presents initial work by the project analyst on the summary report around four types of collaboration: among the campus assessment team members, within the library, across the campus, and among the AiA librarians.

Introduction
Academic librarians are connecting with campus partners in novel ways to question and discover how they bring value to their institutions. To foster these partnerships, the Association of College and Research Libraries (ACRL), with funding from the US Institute of Museum and Library Services, launched “Assessment in Action: Academic Libraries and Student Success” (AiA) to:

1. Develop academic librarians’ professional competencies needed to document and communicate the value of the academic library in relation to an institution’s goals for student learning and success.
2. Strengthen collaborative relationships with higher education stakeholders including campus faculty, academic administrators, and assessment officers.
3. Contribute to higher education assessment by creating approaches, strategies, and practices that document the contribution of academic libraries.

The three-year AiA program is helping hundreds of postsecondary institutions of all types develop campus partnerships to create the engaged library of the future. Its design is based on input from two invitational summits initiated in response to recommendations to build librarians’ capacity in this area. Each selected institution has a team with a librarian and at least two people from other campus units. Team members include teaching faculty, other librarians, and administrators from campus units such as the assessment office, institutional research, writing center, academic technology, and student affairs. The librarians participate in a formal 14-month professional development program and are leading their campus teams in developing and implementing action-learning projects which examine the impact of the library on student learning and success.
The action-learning projects consider different aspects of the academic library (e.g., collections, space, instruction, reference, etc.) and their relationship to student learning (e.g., course, program, or degree learning outcomes) and/or success (e.g., student retention, completion, or persistence). Many projects will be replicable at other libraries or contain elements which will be transferable to other settings.

Profile of First Year Institutions
This paper presents a preliminary review and synthesis of project reports from the first 75 institutions to participate from April 2013–June 2014. To better understand that preliminary analysis, it is useful to know more about those participating institutions. The institutional teams for AiA were selected through a competitive application process designed to ensure representation from an array of geographic regions and postsecondary institutions. They came from 29 US states and 3 Canadian provinces spanning 7 time zones (Hawaii to Nova Scotia). Their accrediting agencies are:

- Middle States Association of Colleges and Schools, Middle States Commission on Higher Education 15
- New England Association of Schools and Colleges, Commission on Institutions of Higher Education 9
- North Central Association of Colleges and Schools, The Higher Learning Commission 21
- Northwest Commission on Colleges and Universities 4
- Southern Association of Colleges and Schools, Commission on Colleges 12
- Western Association of Schools and Colleges, Accrediting Commission for Community and Junior Colleges 3
- Western Association of Schools and Colleges, Accrediting Commission for Senior Colleges and Universities 6
- Other 5 (1 Medical, 4 Canadian)

The teams include a diversity of types of postsecondary institutions as follows:

- 10 Associate’s
- 7 Baccalaureate Colleges
- 32 Master’s Colleges and Universities
- 6 Doctoral/Research Universities
- 18 Research Universities
- 1 Special Focus Institution (Health Sciences)
- 1 Tribal

Projects examined a variety of library factors including instruction (games, single/multiple session, course embedded, tutorials), reference, physical space, discovery (institutional web, resource guides), collections, and personnel. They used a variety of methods and tools to collect direct and indirect data. These included: survey, interviews, focus groups, observation, pre/post test, rubric, student portfolio, research paper/project, other class assignment, test scores, GPA, degree completion rate, and retention rate.

Emerging Themes of Collaboration
Although the specific areas of focus in the assessment projects at the 75 institutions varied widely, collaboration was essential to all of the projects. As Deb Gilchrist, vice president for learning and student success at Pierce College, noted in her opening talk at this conference, it is important to look at the process, not only the end product, of assessment. Collaboration is very much an element of the process dimension.

Our initial review of the project reports prepared by the AiA teams and the comments generated in two focus groups with 38 of the librarian team leaders at the American Library Association Annual Conference in June 2014 centered on features of collaboration that influenced the assessment process and factors that enhanced or presented barriers to effective collaboration. Four types of collaboration are particularly noteworthy from this initial review:

1. collaboration among the campus assessment team members;
2. collaboration that occurred within the library in relation to the projects;
3. collaboration across the campus; and
4. collaboration among the AiA librarians from the 75 academic institutions.

In the following discussion of these four types of collaboration, initial impressions and emerging themes about librarians’ experiences with the AiA project are highlighted. A systematic analysis of the data will be conducted in fall 2014.

Among the Campus Assessment Team Members: Leading Collaboration
As noted earlier, the project design requires that the librarians include at least two team members who are not part of the library’s staff. The librarians frequently mentioned the benefits of having
different perspectives brought into the discussions on the project teams. Through collaboration with their team members, the librarians gained an understanding of the priorities and functions of other campus units. One librarian commented, “My self confidence in interacting with individuals outside the library (e.g., campus administrators, faculty members) has increased significantly.” Likewise, the librarians reported that team members gained an awareness of the library, particularly in terms of its contribution to student learning and success.

Several librarians mentioned the value of having teaching faculty on the team, in comparison to academic administrators. While academic administrators might lend a certain cache and leverage, the teaching faculty were attuned to the potential instructional role of librarians and were particularly helpful in designing assessment instruments that measure and document learning outcomes. As one librarian commented, “Teaching faculty believe in the value of information literacy.”

Prior experience working with one another also promoted collaboration, because a basic level of familiarity and comradery existed. The team’s project work got off to a quicker start, and the librarian’s facilitation of the group dynamics was easier. Group dynamics came into play in another way as well. During the 14-month project, several teams faced changes in membership. In a few cases, librarians moved on to new positions. More frequently, however, it was other members of the team who had to leave and be replaced. The challenges of accommodating a new team member had more to do with the relationship aspect of group dynamics (i.e., personalities, styles of communication) than with the task aspect of group dynamics (i.e., who is doing what work).

The project teams typically consisted of 3–5 members, a size that seems most effective for promoting collaboration and getting the project completed. Many teams had to readjust their project schedules for a number of reasons (e.g., IRB delays, changes with course offerings). A team’s small size allowed for flexibility and nimbleness, particularly in comparison to the often larger, more cumbersome, and formalized campus committees on which the librarians typically participated.

Sustaining project momentum was one of the most significant challenges encountered by the librarians leading the teams. After the initial enthusiasm of launching the project, lack of time and competing priorities often took their toll. The librarians reported that when this type of disengagement started to emerge, they realized that their role as team leaders necessitated intentional and directed facilitation, including establishing a clear timeline for tasks, delegating responsibilities, and providing frequent updates. They became aware of the need not only to facilitate the group’s activities but also to lead the collaboration. This type of proactive stance is reflected by a librarian who commented, “I feel more confident in my ability to take a project from idea to completion and to engage with other professionals on campus to make it work.”

In the Library: Focused and Strategic Collaboration

For a significant number of the librarians who led the campus teams, the AiA project put them in a new role in relation to the rest of the library staff. Several of the AiA librarians reported that the project was somewhat isolated from other library activities. At times, the purpose and benefits to be gained from the assessment were questioned by staff. As one librarian said, “[Some] library faculty are skeptical...They did not want me to assess the instruction program because they thought it might be used against them.” The assessment project often required that the librarians increase communication and collaboration with other library staff. These interactions provided opportunities to inform the staff about the assessment process and its role in improving library services and resources. Some librarians noted that, in retrospect, they wished that had involved more library staff in their AiA project activities. Through their AiA experience, they recognized the importance and potential for collaboration with library staff to move assessment projects forward. In fact, many of the librarians reported that they are now considered the go-to person for assessment activities at their library.

A library’s organizational structure and culture had an impact on collaboration within the library. At those libraries where some staff members have designated assessment responsibilities, the AiA project was more integrated into ongoing library assessment activities and evaluations of services, instructional programs, and collections. These
libraries, in effect, embrace a culture of assessment, and the AiA project expanded their assessment work. For those librarians who saw their projects as isolated from other library activities, they developed an understanding of the importance of continuous assessment, rather than implementing individual, and often disconnected, assessment projects. To meet the goals of the AiA projects, the communication and collaboration at the library was focused and strategized, as exemplified in the following quote from one of the team librarians: “Librarians have realized that talking about the value of students having a library experience as an undergraduate student is an important conversation we need to continue to have and explore.”

**Across the Campus: The Ripple Effect of Collaboration**

As we are well aware, assessment is the conversation in higher education and on campuses. Administrators are hungry to see assessment initiatives launched and the findings shared. As a result of the AiA projects, many of the librarians became, dare we say, “celebrities” on their campuses in the eyes of administrators. Administrators knew about the AiA project, because they had to sign off on the application and agree to support the assessment project (i.e., financial, access to resources). These administrators talked with other campus administrators and faculty about the projects. In addition, the team members—the faculty and institutional researchers—talked about the projects with their colleagues. The librarians also gave presentations about their project at various campus venues. For some librarians, delivering a presentation at venues on campus other than at the library was a new experience. These librarians mentioned that they had to consider who would be in the audience and their potential interest in the project.

The librarians reported that the visibility of the library and librarians as partners on campus increased greatly as a result of the AiA projects. The word “visibility” was used again and again in the librarians’ comments. On librarian commented, “I was asked to speak on a panel about the progress of our project at a [workshop] last fall. This brought positive attention to the project and the library.” In fact, administrators and staff of various campus units now often mention the library project as a model and encourage others on campus to consult with the librarians to learn more about assessment. Institutional buy-in from administrators and the librarians’ work with team members from across the campus has expanded the library’s sphere of influence on campus. The collaboration that occurred at the institutional level could be characterized as a “ripple effect” as reflected in these two quotes from librarians:

> [AiA] signaled a change in focus for [our library], from assessment “for internal use only” to assessment for internal and external stakeholders.

and

> Even applying for this project gave us the opportunity to begin campus conversations about assessment and demonstrate the library’s willingness to engage in and learn from assessment.

**Among the AiA Librarians: Building a Community of Practice through Collaboration**

Throughout the fourteen months that the librarian team leaders participated in AiA activities, a fourth type of collaboration was occurring. In the AiA learning cohorts and within the larger AiA learning community, sharing ideas and lending general support was critical to the success of most of the projects. The librarians reported that face-to-face AiA sessions in particular enhanced collaboration. The online learning was efficient and promoted communication but was not always the preferred mode for collaboration. As some librarians noted, participation in the online environment was occasionally uneven. While supportive communication and collaboration were certainly helpful, critical commentary was also valued. The librarians made note of the usefulness of the peer review process when designing their research questions and poster presentations. Collaboration seems to be best when it combines elements of knowledge sharing, encouragement, and structured criticism and feedback.

The AiA experience has also fostered networking among the librarians. A number of librarians mentioned that they are partnering with one another to prepare conference presentations.
Thus, collaboration is being sustained beyond the scheduled AiA activities.

AiA was designed to foster a community of practice around assessment work in academic libraries. Etienne Wenger-Trayner, who has been influential in developing and advancing the idea of a community of practice, provides a clear, functional definition that has been integral to the AiA design: “Communities of practice are groups of people who share a concern or a passion for something they do, and learn how to do it better as they interact regularly.” Our initial review of the AiA project reports indicate that a community of practice does seem to be developing. The librarians are sharing knowledge and experience as they work toward a common goal. As one librarian explained, “I know how collaborative [assessment] has to be to succeed. I know it’s OK if something doesn’t work the first time. I know colleagues from AiA that I can correspond with!” Another librarian also focused on the benefits of being part of an assessment community that extends beyond the AiA experience, “My AiA experiences have made me aware of how important it is to have a group of people all working towards a purpose together... both from AiA and my colleagues.”

Conclusion
The importance of creating a learning environment that promotes collaboration and provides librarians with strategies to engage assessment teams and colleagues in their libraries and across campus is emerging as a critical piece in the AiA project and its goal of helping academic librarians demonstrate value in relation to their institution’s goals for student learning and success. The role of collaboration in assessment activities and other dimensions of the AiA projects will be analyzed in the coming months. ACRL will disseminate a full summary report in fall 2014, along with the individual project reports, for use by the wider academic library and higher education communities. Find out more at www.acrl.al.org/value.

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Endnotes
4. Oakleaf.
Time Lords of Instruction: Knowing When to Teach Which Skills in a Major Program from Student and Instructor Feedback

Ashley Ireland
Murray State University, USA

Abstract
Murray State University Libraries, a regional comprehensive university in Kentucky, has implemented a model to proactively interject library/information literacy sessions into major programs in order to reinforce the value of the academic library on student learning outcomes. The librarians developed a tiered library/information literacy instruction model, targeting research-intensive courses within all major programs by analyzing past instruction session data, feedback from faculty and department chairs, and the university bulletin to target multiple courses within each undergraduate degree program for graded library/information literacy instruction. This tiered approach allowed for the capture of data from multiple sources regarding the impact of the model. Each instruction session was evaluated by both students and faculty. Students evaluated the sessions by answering four questions, two of which were analyzed using quantitative methods and two of which were analyzed using qualitative methods. The results of this assessment have garnered helpful information about repeated instruction, timeliness in the semester, and timeliness in the program.

Context
In the 2013–2014 academic year, the research and instruction librarians at Murray State University conducted 317 information literacy/library instruction sessions, and reached 7,108 students, up from just 283 sessions and 6,213 students reached just three years prior. This trend, while appearing to be impactful, was quickly becoming unsustainable and unpredictable. At Murray State, there are seven research and instruction librarians (R&I), each serving a particular discipline. In one major program, there were 29 sessions taught over three academic years, and another program where only four sessions were taught in the same time frame. There were a number of major programs that had no instruction sessions taught in that span. As an attempt to reduce redundancy for students and to even the workload for R&I, the director of user and instruction services began investigating methods for targeting instruction for maximum impact.

The query tier* (OR scaffold* OR scale) AND instruction in Education Source results in almost 9,000 results. The idea of targeted or scaled instruction is not a new idea in education. In libraries, instruction was typically a teaching faculty-initiated request, and the libraries as a service unit responded to those requests when possible. In the last decade or so, library literature began research about the idea of targeting instruction for libraries.¹

In early 2013, R&I began combing through syllabi and course bulletins to target research-intensive courses in each major program. The goal was to target two to three courses in each program that reflected a formative and cumulative point for research skills. Programs were defined as undergraduate or graduate majors or areas. The plan was implemented in the 2013–14 academic year, although requests for instruction in courses that were not targeted for instruction were still accepted during transition.

Methods
To assess the effectiveness of the scaffold, we added a student feedback form. The form is a quarter-sheet of 8.5” x 11” paper consisting of four questions to the students given at the end of each instruction session:
1. How much of the information presented was new information to you? (very little; some; most; or all)
2. How much of the information presented to you will be useful in moving forward, either in this class or others? (very little; some; most; or all)
3. What is one skill or resource that you found helpful in learning about today? (open ended)
4. What can you tell us so that we can do better in the future? (open ended)

The back of the sheets were coded with information about the course, section, instructor, entry number, and librarian teacher. The instructor feedback forms that had been utilized for many years were also used as tools for evaluation.

In the first year of implementation, we received 3,154 instances of feedback from students and 7,108 students were counted as participating in the sessions. Because of efforts associated with another assessment project, we know that there were 4,360 unique users enrolled in the sessions we taught. Each entry number for courses in which we did instruction were captured, and at the end of the semester the enrollment for each course was requested from the Registrar’s Office. We know that we reached roughly 40% of the scaffold courses.

Results and Discussion
Because of this assessment and evaluation effort, we have made a number of changes to the scaffold structure. First, we have changed a few of the courses targeted to more appropriate courses. For instance, English 221: Introduction to English Studies was an initial target for the formative IL instruction for the English literature programs. It was determined to change this was not the most appropriate place for the formative instruction, as the Introduction to English Studies course strictly teaches the evaluation of a primary source for scholarship, with no reliance or expectation to utilize secondary sources. Instead, the chair of the department suggested targeting English 099: Transitions (an introductory or freshmen orientation to the program) instead, as a good time to introduce the difference between primary and secondary sources with regard to literatures in English.

The student feedback was analyzed a number of ways. The first two questions, which utilized Likert-based answers, were coded using a one to four range. Thus, the answer of “all” to either question was coded as a four, and so on until “very little” was coded as a one. The answers analyzed using the average function in Excel. The average of student answers to the question “How much of the information presented was new information to you?” was 2.53 for all responses. Students in scaffold courses answered with an average of 2.48, and students in non-scaffold classes answered with an average score of 2.61. Thus, students are receiving more redundant instruction outside of the scaffold than in classes that were specifically targeted.

The average student answers to the question “How much of the information presented to you will be useful in moving forward, either in this class or others?” was 3.26 for all responses. Students in scaffold classes answered the same as students in non-scaffold classes, all at 3.26. These figures were interpreted to say that students appreciate some reminders of library instruction even when they have had instruction in the past.

The open-response question garnered useful data, too. Responses supported increased instruction at the early point in the scaffold:

“work w/ earlier students”—BIO (Biological Sciences) 697

“I thought this was an EXCELLENT session—but I do wish I would’ve learned this earlier!”—JMC (Journalism and Mass Communications) 397

“go to mostly underclassmen so students know this earlier”—MGT (Management) 590

“using an * in search—wish’d learned that 4 years ago...”—MGT (Management) 590

“Teach these sooner. Helpful too late as I graduate in 4 months”—MKT (Marketing) 565

Responses also supported less instruction:

“Nothing. Just had this lecture (4) times prior”—SOC (Sociology) 340

“learned this several times before”—BUS (Business) 215

“this is the second time I have done this with separate classes”—BUS (Business) 215

“I have been through this 5 times” COM (Communications) 201
“nothing. I’ve just heard this so many times already”—ECO (Economics) 310

“this is my third time having the intro to the business website and this was by far the most helpful”—ECO (Economics) 310

“it is all great, I just have done this quite a few times”—GER (German) 331

“I’ve seen this presentation like 12 times”—JMC (Journalism & Mass Communications) 168

“it was good, I’ve just heard it many times”—MID (Middle School Education) 395

Capturing the entry numbers for each class, and requesting student enrollment for each, further supported the need for less instruction:

The count for the total number of participants in instruction was 7108 students. However, there were only 4360 unique students. We know that we reached 26% of students more than once in that year of instruction:

• 876 students were reached in two instruction sessions
• 116 students were reached in three instruction sessions
• 8 students were reached in four instruction sessions
• 2 students were reached in five instruction sessions

From this information alone, we began turning down non-scaffold instruction session requests from faculty in programs that had significant redundancy. Using the data has ensured that positive relationships remain.

Although it was not an intended outcome, the open-response questions also gave us valuable information about the timeliness for instruction within the academic semester:

“Maybe do this early in the semester”—ENG (English) 105—taught 4/25

“present earlier”—ECO (Economics) 310—taught 3/30

“Present this information earlier”—EDU (Education) 099—taught 11/1

“Come earlier in the year”—EDU (Education) 099

“Meet earlier”—EDU (Education) 099—11/1

“earlier in the year”—EDU (Education) 099—11/1

“have this session earlier in the semester”—EDU (Education) 099—11/1

“Tell us about search pages earlier”—EDU (Education) 099—11/1

“tell us this earlier”—ENG (English) 105—10/9

“inform us earlier in the year”—ENG (English) 105—10/16

“presentation would be helpful earlier in the semester”—ENG (English) 105—10/16

From these comments, we have been able to better schedule instruction that was requested for inopportune times in the semester. This is not always able to be accommodated due to scheduling conflicts, but data supporting timeliness has been helpful in avoiding instruction at times when it is too early or too late for impact.

All data will continue to be captured in order to monitor the effectiveness of instruction in programs that are constantly evolving. Our goals are to see the number of students reached multiple times in a year reduced, to see the number of unique students reached per year increase, to see the answer average to the question about how helpful instruction is moving forward to increase, and to receive fewer negative comments about timeliness of instruction.

Notes
This presentation reported on an Assessment in Action (see: http://www.ala.org/acrl/AiA) project at Saint Mary’s College in California and a continuation of this research at California State University, East Bay (CSU East Bay). The research project at Saint Mary’s College of California (SMC) involved taking a traditional one hour, one shot session incorporated into the first year composition course and making it “flipped” by adding an online lecture on the Toulmin model of argument, which was followed up with a hands-on classroom instruction in applying the Toulmin model to assess argument in scholarly articles. At CSU East Bay, this same approach was used in a two-unit information literacy class with several additional lessons using images to illustrate elements of argument and research. The assessment at SMC was done using a two-group comparison methodology with the SAILS test (see: https://www.projectsails.org) administered as a posttest to students, surveys administered to faculty and students, and assessment of student papers done using a rubric. At CSU East Bay a case study approach was used, which included a pre/posttest of information literacy skills and a rubric assessment of student papers.

The focus of the assessment project was on teaching the evaluation phase of research using the Toulmin model, so students (at both SMC and CSU East Bay) became familiar with the Toulmin model via a PowerPoint presentation, then did hands-on work applying the Toulmin model to analyzing arguments in scholarly articles. At SMC the method was implemented in three sections of the first year composition course and compared to three sections of a more traditional information literacy session. At CSU East Bay the method was used in two sections of a two-unit information literacy course taught as part of a first year experience set of General Education (GE) courses. The instruction in applying a Toulmin-based analysis to articles was supplemented with instruction in:

- Identifying alternative perspectives using news photographs
- Evaluation of evidence using advertisements and infographics
- Understanding bias using political cartoons

At SMC, librarians were trained in the use of the Toulmin model and it was then implemented in three sections of English 5, the first year composition course, by librarians trained by the SMC researcher, while three sections received traditional information literacy instruction. At CSU East Bay, the method was implemented in two sections of information literacy by the author. The results from the papers analyzed at SMC were inconclusive, with the papers in the sections receiving the traditional instruction scoring higher in the “critical evaluation of sources” category of the rubric and the experimental group papers scoring higher in the “seek and identify confirming and opposing evidence” category.

At CSU East Bay, students showed a statistically significant increase in scores on the pre/posttest for information literacy and also performed well in the rubric evaluation of the papers, scoring an average of 2.9 (just below “good,” but still “adequate”) in the rubric evaluation of papers which combined learning outcomes from the information literacy and critical thinking GE courses that were part of the first year learning community.

The overall result of this assessment was that training students in the Toulmin argument model showed promise as a way of teaching students to...
evaluate sources in a way that goes well beyond the checklist approach often favored by librarians.

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**Works Cited**


3. Ibid.
Assessment in Action: A Journey through Campus Collaboration, a Learning Community, and Research Design

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Abstract
Members of the first cohort (2014) of the Association of College and Research Libraries’ (ACRL) Assessment in Action (AiA) learning community share the impact of the AiA program on library and university assessment initiatives. This article shares brief examples of effective and challenging cross-campus collaborative assessment projects and the five best practices the authors developed through the year-long experience of examining student success in three different academic library environments.

Introduction
Members of the first cohort (2014) of the Association of College and Research Libraries’ (ACRL) Assessment in Action (AiA) learning community found that their experiences significantly influenced their library and university assessment initiatives. By participating in a structured group assessment process, each team leader learned best practices and practical lessons for coordinating a large-scale assessment project with non-library campus collaborators. The projects ranged from a focused examination of a specific learning outcome in a first year experience program to a broad initiation of a multi-service program evaluation project that included the campus writing center and speech lab. The individual library assessment projects summarized here were helpful to the library communities on their own, yet the team leaders realized that the most memorable lessons learned focused not on outcomes but rather on the process itself—the process of planning, leading, and communicating a team-based assessment.

Grand Valley State University
In 2012 Grand Valley State University Libraries piloted a new academic support service based on best practices in peer learning. The service offers one-on-one or small group consultations with a well-trained student employee in a highly visible yet comfortable location in the center of the library. The twist is that these “peer research consultants” provide consultations in the same space and at the same time as consultants from the campus writing center and speech lab. All three services are independently administered—different colleges, different deans, different supervisors, and different budgets—yet they work collaboratively to provide comprehensive academic support; that collaborative service is called the Knowledge Market.

The assessment challenge began with the first year pilot. Not only did administrators need to monitor and adjust regular operations through a formative program evaluation process, but they also needed to begin a more rigorous long-term assessment of the Knowledge Market. The expectation is that the whole service is greater than the sum of its parts. We set out to inquire whether positive learning outcomes are greater when the student interacts with multiple services compared to only one service at a time. In other words, the assessment should test whether collocating the three services so that students have research, writing, and public
speaking assistance in one, low-threshold service, correlates with positive student learning outcomes.

The long-term assessment (still underway) began with a few simple and achievable incremental steps. The library asked each research consultant to end the consultation with an evaluation form that asked three questions about student perception: how comfortable was the student with the consultant; how helpful was the consultation; and how confident is the student in completing their assignment. That initial test of measuring basic student perceptions demonstrated that high return rates are possible (we achieved a 98.5% return rate), that student perceptions are positive, and that measuring student learning outcomes in such a variable service will be exceptionally challenging. How can we measure student learning outcomes in a half-hour reference interview? Perhaps the more important question is this: Do they need to be measured? And how can we correlate data from the writing center and speech lab with our library data?

One of the most important outcomes of this project was the development of a relationship with the Institutional Analysis (IA) department (called Institutional Research at some other institutions). The library is now using ScheduleIt (a custom appointment scheduling application used in the Knowledge Market) and LibAnalytics to collect consultation, reference, and instruction data, which is being regularly sent to IA with lists of questions that can only be answered with student-level data (e.g., Which majors are represented by the students who use the consulting service? How many freshmen use the consulting service? How many students at each grade level do we reach through direct library instruction?). The analyst returns the results in aggregate, which preserves the privacy of the students yet still provides the library with rich descriptive and correlative data that would otherwise be inaccessible.

AIA brought assessment to the forefront of learning assessment and program evaluation conversations in the university libraries. Data collection procedures are now routine, the head of instruction is in regular communication with Institutional Analysis, and early analysis using these new collaborative assessment processes is revealing exciting trends in student self-efficacy, retention, and skill development in library student employees.

**Pacific Lutheran University**

At Pacific Lutheran University (PLU), the primary focus of the AIA project was to investigate if the number of information literacy (IL) instruction sessions a student participated in during a First Year Experience Program (FYEP) course positively influenced his/her development of the University’s Critical Reflection integrative learning objective (ILO). This campus priority was selected because of the direct relationship between the ILO and IL. The ILO was operationalized into the following components: demonstrated use of the library, use of a variety of sources, use of credible/reliable sources.

Classroom faculty at PLU, as at other institutions, have expressed concerns about the type and quality of sources students cite in research projects. Evidence from our research indicates that a series of shorter IL instruction sessions is more beneficial for student learning than one long session. Data gathered from citation analysis of final projects and content analysis of student reflection surveys showed that students receiving multiple IL sessions used library resources at a rate of 80% compared to 53% for students in the one shot sessions. The multi-session students also reported employing a greater variety of search strategies to find a broader range of sources.

The PLU project team included representatives from the FYEP and the Office of University Assessment, Accreditation, and Research. The FYEP has been a leader in assessment efforts on campus, as well as a strong supporter and user of library instruction. Building on these established strengths and relationships provided the AiA project a solid foundation and increased faculty buy-in.

Through this project, librarians have developed a greater understanding of the complexity of assessment and the need to have a clear assessment plan in place. Collaborating with more experienced colleagues and attending assessment scoring sessions in other units on campus offered increased visibility of the library’s initiatives.

Participation in AiA has helped situate the PLU library as an active participant in assessment efforts on campus. Evidence of this can be found in the recent accreditation report where the FYEP/AiA project received a commendation.
from the Northwest Commission on Colleges and Universities reviewers.

Rockhurst University
Rockhurst University sought to explore its one-shot instruction sessions with English Composition students. Was this approach the best one and what impact were these sessions having on the students in terms of their understanding of the research assignment, the library’s materials and electronic resources, and also the library’s services (chat, face-to-face reference assistance, etc.)? Data were gathered using a pre/post survey as well as a citation analysis. Results suggest that 87% surveyed were satisfied to very satisfied with their interactions with the library and 64% reported that they had asked for help at the reference desk. Ninety percent reported that they were very satisfied with library instruction and 87% noted that they used the library’s website and databases to research for course papers and projects.

The RU team consisted of the team leader librarian who was the department head for research, learning, and assessment services, the assessment coordinator, the English Department’s faculty chair, a faculty member from the Education Department, and another faculty member from the Business School. Membership was later extended to the library director and additional members of the English Department since the project’s focus was on English composition students.

Rockhurst’s participation in the AiA program greatly improved collaboration and communication between the multiple departments and the library as well as between the English and Education departments and the Business School. One positive outcome is that the project will soon be conducted with students in the Business School. Faculty and staff across the campus learned that the library was involved in assessment projects and became advocates for our programs, initiatives, and library staff members.

Key Takeaways
Despite the differing nature of the individual projects described above, the librarian team leaders shared a sense that the true value of the AiA experience was to be found in the development of a best practices approach to the process of assessment. While the specifics of the process will, of necessity, change from one institution to the next and from one project to the next, these core principles can serve as a strong foundation for the establishment of an assessment project in any library:

• Relationships: Build on existing relationships and develop a strong relationship with institutional research.
• Culture: Work on building a culture of consistent, reliable data collection so that you can feel confident about your results.
• Conversations: Have structured conversations about assessment with everyone, not just with the research team.
• Relevancy: Connect with your work current institutional initiatives and documents.
• Communication: Toot your own horn!

These principles acknowledge that colleges and universities often have exceptional expertise in data collection, statistical analysis, curriculum development, and strategic planning, and that smart library assessment planners take advantage of that expertise. Building a culture of assessment requires participation by a great many stakeholders, not just the assessment coordinator. Those stakeholders can then share this culture across the campus by intentionally connecting the assessment work of the library to existing initiatives and the university’s strategic plan. Ultimately these best practices provide academic librarians a framework with which to communicate the value of the library using the shared language of assessment.

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Don’t Just Collect the Data! Closing the Loop with User Surveys

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Abstract
Libraries commonly conduct user surveys in order to gather information about user practices, preferences, and satisfaction. Given that user surveys are often expensive and time-consuming to conduct, it is wasteful if the data that is collected is not used. Unfortunately, many times survey data does not appear to be “actionable” and so the final outcome of a survey project is a report of the data that gets filed rather than a set of actions that get taken. This panel used case studies to identify best practices in “closing the loop” with survey data so that the investments made in user surveys result in valuable outcomes for library users.

Libraries commonly conduct user surveys in order to gather information about user practices, preferences, and satisfaction. Such surveys can be locally developed or outsourced under contract (e.g., LibQUAL+®, Ithaka, MISO, etc.), and may be focused on interactions with the library specifically or on the information environment more generally. Given that user surveys are often expensive and time-consuming to conduct, it is wasteful if the data that is collected is not used. Unfortunately, many times survey data does not appear to be “actionable” and so the final outcome of a survey project is a report of the data that gets filed rather than a set of actions that get taken.

The cases studies that follow identify best practices in “closing the loop” with survey data so that the investments made in user surveys result in valuable outcomes and impacts for library users. Across the case studies are examples of longitudinal data gathering, targeted selection, and deployment to serve decision making in a strategic initiative, meta-analysis of multiple surveys through retrospective mapping and re-analysis, thematic analysis across multiple survey instruments on a single aspect of user experience and preference, and building on standard reports from contracted surveys with local detailed analysis.

These three cases also exemplify what it means to be a learning organization—an organization that is oriented to learning about and from its users and employees in order to improve the value that it offers and creates. A library that is a learning organization pursues an organizational learning agenda characterized by a willingness to accept input and to change its practices in order to better serve its community. Taken together, these three case studies demonstrate that user surveys are a useful tool for identifying community needs and initiatives the library can undertake to meet those needs.
Longitudinal Data Collection and Use: LibQUAL+ at Radford University, 2005–2014 (Eric Ackermann)

LibQUAL+ is a library service quality survey created and maintained by the Association of Research Libraries (ARL). It measures customer satisfaction across three areas or dimensions: Affect of Service, Information Control, and Library as Place. Each survey item is rated three times on a 1 to 9 scale for minimum, expected, and perceived levels of satisfaction. LibQUAL+ uses gap analysis to determine the satisfaction distance or gap between the perceived and minimum levels (called the adequacy gap) and the perceived and expected levels (called the superiority gap). ARL also provides the descriptive statistics for all the results including the gap analysis.

How does Radford University use LibQUAL+?
The purpose of using the same survey instrument over time is twofold. First, the results alert us to changes in our user needs. This allows us to shift our limited resources accordingly to meet these needs with new practices or services, as well as discontinue those that are no longer effective. Second, the results allow us to track the effectiveness of any changes. Did they work? If not, why not?

To provide this longitudinal data, Radford University (RU) initially used a three-year survey administration plan: survey the students in year 1, the faculty and staff in year 2, with no survey in year 3. We followed the plan for the 2005/2006 and 2008/2009 administrations until we realized no advantage was gained by this structure. In 2014, after the Great Recession, we changed to a two-year plan: survey everyone in year 1, with no survey year 2. With this plan we intended to achieve an improved response time to more rapidly changing user expectations while saving money on the extra survey iteration. All the survey administrations were coordinated with the RU Office of Academic Assessment, which also generously funded all the LibQUAL+ survey iterations to date. This coordination prevented any overlapping survey administrations between our units as well as reducing any potential respondent survey fatigue.

We used the original version of the survey instrument (twenty items and a comment box) for all but the most recent iteration. In an effort to boost our sagging undergraduate response rate, we switched in 2014 to the LibQUAL+ Lite® instrument. The Lite instrument is shorter, consisting of only of eleven items (five core items plus six randomly drawn from the remaining fifteen) and a comment box.

For the ratings data, we used the adequacy gap results from the descriptive statistics provided by ARL. To gain the most insight from our LibQUAL+ survey data, the comments were subjected to qualitative analysis. For the 2005–2009 results, we used Atlas.ti software, switching to Dedoose in 2014. The analyzed comments often provide insight into any changes in the ratings, as well as uncovering user issues or concerns not readily apparent in the ratings.

What did Radford University change based on the LibQUAL+ results?
Rather than attempt a comprehensive review of all the changes we made based on the survey results, three examples are given, one for each survey dimension.

Example 1: Affect of Service (AS). The 2008 survey of students revealed that consistently poor customer service was provided by the student assistants at our two service points, the Front Desk and the Reference Desk. This issue was detected by a significant drop in the AS ratings, amplified by related negative comments received. In response, both service points revised and implemented ongoing customer training programs for their student assistants. The Front Desk also added trained, full-time supervisory staff to oversee each shift. These changes resulted in a significant decline in complaints in the comments and improvement in the AS ratings reported in the 2014 survey.

Example 2: Information Control. The qualitative analysis of the comments from the 2005 survey demonstrated the students’ frustration with the poor quality of the hardware and software in our available public access computers. In response, the library technology unit implemented a program of ongoing computer upgrades as funds became available. This resulted in the disappearance of the issue from the comments received in subsequent surveys, only to be replaced by printer issues that are out of our control!
Example 3: Library as Place. The qualitative analysis of the comments from the 2005 survey indicated a strong desire by the students for more dedicated study spaces for individual and group study. The demand became an ongoing issue clearly visible in the comments and ratings of the 2008 and 2014 surveys. Because of the funding needed to provide these spaces, the mediation was implemented over time. By 2006, two floors were dedicated for quiet study, six dedicated group study rooms built, and a quiet study classroom designated. The Reference Collection Area was converted to group study spaces (now the Library Commons) during 2011–2014. These changes resulted in a moderate decline in study space complaints in the comments and an equally moderate improvement in ratings by 2014.

What’s next for Radford University and LibQUAL+?
We will continue to use the LibQUAL+ survey on a regular basis to longitudinally track our users’ satisfaction with our services and resources. Our analysis will continue to utilize the quantitative adequacy gap ratings and qualitative comment data to detect changes in the needs of our users and the efficacy of our efforts to meet them.

Assessment and Strategic Planning: Using the Ithaka S+R Surveys at University of North Carolina at Chapel Hill (Heather Gendron)
In 2013, the University of North Carolina at Chapel Hill (UNC-CH) Libraries released a new five-year strategic plan (http://library.unc.edu/wp-content/uploads/2014/02/UNC-Library-Strategic-Plan.pdf). It was guided by an assessment of external factors affecting higher education and research libraries (environmental scan), as well as a campus scan that focused on the changing research, teaching, learning, and professional practices of UNCH-CH community members. A section of the new plan entitled “Investing in Success” featured a goal dedicated to the demonstration and communication of library value through “periodic and comprehensive user-centered assessments” and data collection and reporting activities that “support decision making, improve performance, and demonstrate the value of library services, collections, and environments.” At the beginning of the strategic planning process, UNCH-CH Library’s program of assessment consisted of the regular review of library statistics and numerous intermittent, small-scale, and staff-initiated studies. During the strategic planning process, it became evident that the libraries would benefit from having campus wide survey data that centered on the goals being developed for the new strategic plan. Additionally, we hoped that these surveys could provide library staff with the data they might otherwise seek on their own, through smaller point-of-need studies (thus, centralizing some of our assessment work).

On the heels of creating the 2013–2018 strategic plan, we conducted two campus-wide Ithaka S+R surveys. During the fall of 2013, we surveyed UNC-CH faculty to learn about the impact of digital technologies on their research, teaching, and publishing. The student survey, conducted during the spring of 2014, helped us examine the attitudes and practices of undergraduate and graduate students about their higher education experience, including both course-specific and informal research and learning practices. We chose the Ithaka S+R surveys because they aligned well with our strategic planning goals.

The Research Lifecycle
One of the three major themes of our strategic plan to emerge from our external and campus environmental scans is “The Research Lifecycle.” This theme states that the university libraries will “foster researchers’ success by providing active support throughout the research lifecycle, from identification of the problem through dissemination of results.” In the first year of strategic plan implementation, library staff were highly focused on the support of digital scholarship and data management. Through an analysis of results from UNC-CH Ithaka S+R faculty and student surveys, we were able to identify areas of interest and need in regards to digital scholarship support. Our goals for this theme are to:
1. Provide strong collections and develop new mechanisms for delivering them to researchers.
2. Provide researchers with the space, tools, and information assistance they need to successfully conduct research and manage research results.
3. Support the dissemination and preservation of research results and the measurement of their impact.

From this research lifecycle concept, the idea developed for the libraries’ new “Research Hub”
(launched at the start of the fall 2014 semester). The Research Hub provides skilled staff to support digital research, cutting-edge technologies with training opportunities, and events that showcase student and faculty research, all within spaces designed for consultation, creation, and presentation.

**Closing the Loop**

One particular question from the Ithaka student surveys provided data that proved helpful in the planning of the new Research Hub’s services and spaces: “How important or unimportant to your research is each of the following digital research activities and methodologies today?” Most notable were the large numbers of graduate students who thought certain activities were “important” or “very important”:

- “analysis of quantitative data that you generate in the course of your research” (890 graduate students);
- “analysis of pre-existing quantitative data that you do not generate in the course of your research” (691 graduate students); and
- “using models or simulations” (561 graduate students).

Also notable were the number of “somewhat important” responses, which we interpreted as meaning there might be emerging interest in those areas, such as “writing software or code” (217 graduate students) and “computational analysis of text—text mining” (249 graduate students). Looking at the numbers of students who find these activities and methodologies important gave library staff data to work with in determining the frequency and scale of Research Hub workshops, spaces, and services.

**Best Practices for “Closing the Loop”**

As UNC-CH works across schools to develop a stronger voice and a communications strategy that will help us tell the world about our successes, the libraries must also share the impact of their work. Additionally, it is key that library staff are given the tools to utilize library assessment data. There are multiple ways in which we are sharing the results of our assessment activities, both externally and internally, and specifically the results of the Ithaka S+R student and faculty surveys.

After investing so much time, staffing, and money in conducting the Ithaka S+R surveys, we want to be sure that staff throughout the library feel empowered to use the resulting data. We have created new interactive library staff programs about library collections and services that are each tied to the three main themes of our strategic plan. In doing so, we hope to “close the loop” by continuing to revisit and encourage staff to reuse the library’s assessment data. We share the results of the surveys at library “All Staff” meetings and with the Administrative Board of the Library that includes both faculty and student members.

In order to reach an external audience, we will not only release reports summarizing the results of the two surveys, will also use these reports as a template to create academic department-level reports. These more targeted reports will then be shared with library staff (particularly with subject liaisons) to use in their own planning and to spark discussions with the faculty and students they serve. The goal is to make it easier for library staff to utilize the survey results, by providing short memos or talking point-style documents. In closing the loop with the Ithaka S+R survey data, we found it also helpful to write the final report with the library’s strategic planning goals in hand. This makes the data more clearly relevant to readers. The written reports, briefs, and memos all aim to tell a larger story about the library’s strategic goals and will be tailored to different external audiences.

**Using a Decade of Survey Data to Inform Strategic Decision Making and Future Planning (Elizabeth Edwards)**

Since 2004, the University of Chicago Library has surveyed its patrons on a roughly biennial basis. These surveys, whether licensed or developed locally, have been heavily consulted by library administration in their decision making and strategic planning. This case study summarizes the library’s attempt to close the loop on a decade of patron surveys by conducting a meta-analysis intended to inform current and future decision making during a period of leadership change.

**Project Description**

In June 2013, then library director Judi Nadler proposed “a year of analysis” for the Assessment Planning Team (APT). Rather than conducting a user survey, typically the APT’s major annual initiative, Nadler suggested that the APT reflect on a decade of roughly biennial surveys in order to identify what the library had learned about its users.
and culture. Nadler suggested this project could provide data for library decision making, as well as set the foundation for future assessment projects.

The APT took as source material the five surveys conducted by the library between 2004 and 2013: two instances of the licensed LibQUAL+ instrument, and three locally developed instruments. The library distributed the LibQUAL+ instrument to students and faculty in 2004 and 2007. The experience with this instrument provided the foundation for the library’s annual survey program, and the organization of APT. The findings also provided baseline measurements for many of the library’s subsequent assessment projects. In 2010, the APT debuted its first locally developed survey, which was distributed to all graduate and professional school students. This was followed in 2011 by a survey of undergraduates, and in 2013 by a survey of faculty, post-doctoral students, and emeritus and academic appointees.

Beginning in the fall of 2013, the APT dedicated monthly meetings to the discussion and analysis of an individual population’s response to the applicable surveys; one for each population: faculty, graduate students, and undergraduates. In these discussions, the APT focused on identifying emergent themes from the most recent surveys, and then looked to other library and university sources for supporting data. These data sources included usability testing and other assessment projects conducted by the library, library entrance statistics, usage statistics for electronic resources, and enrollment figures and other campus characteristics obtained from the registrar. For example, if survey responses pointed to changes in library building use, the APT consulted entrance statistics to contextualize respondents’ self-reported use, and then put those statistics in the context of changing university demographics.

**Closing the Loop**

Out of this process emerged seven themes, many of which spanned the three major areas of focus common to all five surveys: collections, services, and spaces. As these themes were intended to inform decision making, they were intentionally kept brief, with discussion focused on areas where the library and its administrators might need to make a decision. For example, a theme documenting the growing needs of off-campus users made a powerful case for greater attention in this area in under two pages. Successes were mentioned but not discussed at length, and areas of broad agreement were largely omitted unless new viewpoints or contexts emerged. For example, the results of a largely successful bookstacks reorganization project conducted following the two LibQUAL+ surveys were noticed in subsequent surveys but went unmentioned in the themes.

These themes were intended for use by current library administration, but midway through the project, the director announced her retirement, creating a new and critical audience: an incoming director. The APT embraced this opportunity to be a bit more provocative, presenting challenges and arguments that incoming leadership might consider revisiting. For example, the lack of agreement among patrons regarding the library’s long food policy could be of interest to a new administration.

Finally, as it is not within the scope of the APT’s responsibilities to identify institutional priorities, no action items were specifically described, allowing library administrators to determine which, if any, themes and challenges were areas for further discussion, assessment, or action.

**Reflecting on the Process**

This project provided the APT—and the library—with a wonderful opportunity to close the loop on a decade of growth and change in the both the library and the university. For newer members of the APT, including the assessment librarian, a deep read of a decade of user surveys helped provide context for the library’s current challenges while also demonstrating the great improvements over the last decade, from the opening of the remarkable Joe and Rika Mansueto Library to small changes in landscaping that improved users’ sense of security on campus. For long-time members, it was also an opportunity to revisit the successes and challenges of the library’s survey program.

An unanticipated outcome of the project was a new direction for the library’s survey program. In addition to the themes, a number of stories emerged from a deep read of the user surveys. For example: a story developed from graduate student responses of the graduate student who drives to campus to spend the day working but finding no secure or personal space in the library (which does not offer assigned or reservable carrels), has
to pack up his things to get lunch (no food in the library) or use the restroom (out of fear of theft), and is constantly frustrated by the distractions provided by other, less serious users of the library (often perceived to be undergraduates). Though the elements of these stories emerged from the surveys, more data are needed to determine whether and how the library should be meeting the needs expressed—personal or reservable space, a more flexible food policy, different ways of approaching noise and the use of library spaces. This need to better understand library users in context resulted in the library’s decision to use a more outward-focused survey instrument in the next fiscal year.

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Abstract
After administering LibQUAL+® and LibQUAL+ Lite® a total of four times, Assessment and User Experience (AUX) staff at Duke University Libraries led a library-wide effort to design, implement, and analyze the results of a survey that focused on our users' satisfaction with library spaces, collections, and services. AUX members collaborated with staff across the libraries and university to administer the survey and analyze results, and then hosted nine focus groups to understand more fully particularly interesting or perplexing aspects of what we learned from our user survey.

AUX staff then worked with the Libraries’ Assessment Core Team and department heads from multiple units to propose potential expenditures, projects, and marketing opportunities that we believe will improve library services, spaces, collections, and equipment or provide more data on key aspects of our users’ experiences with the Duke University Libraries.

Introduction
Duke University Libraries has long been committed to learning more about the evolving needs of our researchers and then implementing innovative services, developing new collections, and building new spaces in response to our users’ demonstrated interests. Like many libraries, we have conducted multiple university-wide surveys in an attempt to learn more about our researchers’ perceptions of the services, spaces, and collections available for their use. We administered LibQUAL+¹ in 2002, 2005, 2007 and LibQUAL Lite in 2011² and were prepared to conduct another university-wide user survey in 2013.

In late 2012, Assessment and User Experience (AUX) staff considered the possibility of administering a survey other than LibQUAL+. While we appreciated the potential for benchmarking and comparing results across libraries that also use the LibQUAL+ framework, we found that we never actually made use of this feature. Perhaps more importantly, we heard from respondents and librarians alike that they found the survey to be too long (prompting our shift to LibQUAL+ LITE in 2011), the question format difficult to understand, and the results cumbersome to understand and analyze. We felt it was time to consider an alternative.

After reviewing numerous in-house and consortial surveys from academic research libraries across the country (University of California-Berkeley, Carnegie Mellon, Dartmouth, MIT, and Princeton, to name just a few), we opted to design our own survey, as we knew this would allow us to incorporate extensive branching and Duke-specific answer choices, including academic departments and pilot programs and services implemented at Duke University Libraries, in particular.

While AUX staff members were very interested in the customized options and answer choices an in-house survey would afford, we also knew that creating a survey from scratch would provide opportunities for staff to be involved at every stage of surveying our users. Our goal was for our Duke-specific survey data to guide staff toward making service design changes and help set the direction of future projects particular to our researchers’ needs. By engaging staff in the survey project from start to finish, we hoped they would be more likely to use survey data to inform changes and improvements to library services they provide or oversee.

Designing the survey: a collaborative endeavor
While our part-time data coordinator took the lead on building our homegrown survey in Qualtrics,³ a survey tool Duke licenses university-wide, she did so with input from numerous library staff, potential survey respondents, and even university staff and faculty with expertise in survey design. AUX staff led countless meetings to determine the ideal structure of our survey and to develop...
questions that would help us learn more about our researchers’ experiences with Duke Libraries and inform future decisions and service design. In addition to leading small group discussions about the format and structure of our survey and questions, we shared our survey with all library staff at library-wide meetings and through e-mail—we wanted no library staff member to feel excluded from the process or to be taken by surprise that we were leading this effort.

After weeks of discussion and work in Qualtrics, we had an instrument ready to test and then implement. Our final survey was short, taking users just four to six minutes to complete, on average, but it was complex, featuring extensive branching and resulting in a 106-page document when exported to Word from Qualtrics.4

As is the case with many surveys, ours started with general demographics questions, then asked users which library they visit most frequently or if they choose not to visit a library, as it was especially important to our liaison librarians in the sciences to provide options for our users who do not visit a physical library. We then focused our core questions around particular services, collections, and spaces we were most interested in learning more about. Again, we asked questions we felt would both help us gather information and, more importantly, prompt us to imagine and prioritize possibilities for services, collections, and spaces. We asked respondents to tell us what they viewed as important by checking items from lists of library services, collections, and spaces. We then asked that they indicate their level of satisfaction with the services, collections, and spaces they selected as “important.” Respondents also had an opportunity to tell us if they believe a service or resource to be important but simply did not know it was available through Duke Libraries (e.g., services for digitizing print materials).

Finally, we invited our respondents to share which library services or technologies would most enhance their library experience or list equipment they wish to check out from the library. This particular question is a major reason we opted to design our own survey: we wanted to hear from our community what they are most interested in our providing or exploring in the future.

Recruiting respondents
Once we fully tested and vetted our survey with library staff and library and university stakeholders, it was time to recruit respondents. At the advice of a university expert in survey design, we opted not to provide incentives for survey respondents, but this is something we will likely reconsider in future iterations of this survey. We initially planned to e-mail directly through Qualtrics a sample size of 500, including approximately 40% undergraduates, 25% graduate students, 25% faculty and 10% other library users (e.g., library staff, university staff, alumni, and outside researchers; this population was recruited through means other than direct e-mail). We ended up receiving from our Institutional Research office the e-mail addresses of all faculty and so e-mailed all faculty at Duke; we believe this led to more faculty responses than we have received in previous user surveys. In addition to e-mailing invitations to complete our survey through Qualtrics, we also posted the survey URL in a prominent location on our homepage and promoted it through social media, student e-mail lists, and subject librarians’ departmental e-mails.

Based on our total population at Duke (approximately 15,000 students and 1,500 faculty), we hoped to have a total of 378 respondents. We were pleased, therefore, when we had 733 total respondents, including undergraduate students (a total of 144 responses, split between two time periods due to low turnout the first time we administered the survey); graduate students (198 responses); faculty (244 responses); and non-library university staff, alumni, and general researchers (147 responses). We administered our initial survey to all user groups in November 2013 and recruited an additional population of undergraduates only in January 2014, as our first response attempt resulted in a very low response rate from undergraduates. This low response rate confirmed our suspicion that the timing for user surveys is especially important for undergraduates,
and we plan to distribute all future user surveys no later than mid-October of the fall semester or mid-February of the spring semester.

Analyzing and sharing results
Just two days after we closed our survey in November, we made a brief presentation at an all-staff meeting to share our initial findings. We shared a few key data points with our colleagues and then invited library staff to begin exploring the survey results that our data visualization coordinator had begun to export from Qualtrics into Tableau Public. We shared the link to our Tableau site broadly and promised staff we would continue to populate it with data visualizations in the coming weeks, as well as host training sessions during which they could learn more about using Tableau to explore survey results. Additionally, AUX staff populated spreadsheets with all free response survey comments and led a small analysis team in reading and coding those data. We also shared these results with all library staff.

Having the data available in these ways enabled subject librarians, for instance, to view the results from faculty and students in the schools and departments they support without our having to create multiple reports to meet individuals’ particular needs. We encouraged units and departments across Duke Libraries to consider all survey data and consider how library staff might respond to what we learned and, further, then propose additional questions to pursue in order to understand more fully our users’ needs and preferences.

After providing ample time for staff to attend training sessions and discuss survey results in their departments, we led an open workshop for staff to discuss feedback they found especially interesting or perplexing and brainstorm ways we might expand or change offerings based on this information.

Just as we did when we designed the survey instrument, AUX staff led survey-related discussions in standing meetings of department heads, this time to determine what we still needed to know from the initial survey. In those meetings, we decided to survey undergraduates again in order to gain more data from this important user population and, additionally, to host follow-up focus groups or semi-structured interview groups that would help us learn more about some of the ideas that our respondents began to hint at in their answers and free responses.

As a result, AUX collaborated with other library staff to lead a total of nine focus groups, targeting students and faculty of our three main libraries in order to learn more about our researchers’ experiences with particular services, collections, and spaces they commented on in the survey.

Responding to what we learned
We then looked back through all survey results and focus group responses and created a list documenting potential areas for follow-up. First, we considered the existing services that we clearly need to do a better job of marketing—these are the aspects of our services or resources our respondents indicated as important yet did not know about (e.g., quiet and food free zones in our libraries; the Graduate Student Reading Room in our main library). We then identified someone to take responsibility for marketing or highlighting these particular services, working with the libraries’ director of communications, where appropriate.

Next, we detailed potential expenditures that we believed would fill a void indicated in our user survey. For example, we proposed purchasing or repurposing existing large format external monitors for researchers to connect to their laptops and buying space dividers to create more individual study options and quiet spaces in our libraries.

Additionally, we described projects that would result in improved services. For instance, we decided to develop and communicate a process for reporting and addressing building or maintenance issues and proposed exploring the use of faculty reading rooms at other libraries in order to determine whether we should add a designated reading room for faculty to existing library spaces.

Finally, we outlined needs for further assessment, including developing targeted user surveys or semi-structured interviews to understand more fully our researchers’ experience accessing online journals, articles, and books for the scanning needs of our researchers. We also proposed multiple projects, including analyzing circulation counts of materials held off-site to determine if there are parts of our collections that should be moved back to campus libraries and analyzing use of public computers.
and scanners to determine if we should purchase additional equipment.

Some individual staff members took ownership for particular projects they were already working on or felt were particularly relevant to their departments, and we directed all assessment projects to our newly reconstituted Assessment Core Team to consider and begin work on, as appropriate. Assessment Core Team members have completed a number of projects and disseminated the results of their efforts and are in the process of leading additional follow-up assessment projects.

**Next steps**

It is important now to be sure our survey respondents and focus group participants are aware of the changes we have made as a result of their substantive feedback. We have distributed news of some of our work through the Duke Libraries website and social media channels and have shared our efforts with the libraries’ advisory boards. We have also followed up with focus group participants, as appropriate. We hope that by making students and faculty aware of the impact of their survey response, we will be able to increase the response rate of surveys we administer in the future.

We plan to conduct another broad-based university-wide user survey in 2015 but already have plans in place to administer a more focused user survey in early 2014. In the meantime, we plan to continue to follow up on aspects of our survey we would like to know more about by conducting observational studies, usability studies, and user interviews, as we are well aware that surveys are only one of many ways to assess the effectiveness of Duke University Libraries’ spaces, services, interfaces, and collections.

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**Endnotes**


The Ithaka S+R Local Surveys of Students and Faculty across Different Institutional Contexts

Roger Schonfeld
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Andrew Asher
Indiana University, USA

Heather Gendron
University of North Carolina at Chapel Hill, USA

Ithaka S+R has developed its local surveys, covering faculty members and now students alike, in response to the increasing interest of library managers in making evidence-based plans and decisions. These local surveys are designed to help libraries gain better insight into the perceptions of faculty members and students as you make strategic decisions for the future direction of your institution. Broadly, key issues covered include: research and information-usage practices; the value of different aspects of the undergraduate experience; instruction and coursework; and the perceived role and value of the academic library. Now that these surveys have been run locally at approximately three dozen colleges and universities, we are beginning to establish the basis for analyzing how these populations differ on these key strategic issues. The purpose of this panel session is to analyze noticeable differences, or surprising similarities, that have emerged from experiences to date with the Ithaka S+R local surveys. The panel covers two important types of differences: first, differences between faculty members and students, both undergraduates and graduate students, on research and information-usage practices, and the perceived role and value of the academic library; and second, differences within each of these two populations across different universities and colleges, on topics such as research methods and discovery practices, where institutional setting impacts responses.

While institutional differences will be explored broadly, we focus especially on the experience of two large public research-intensive universities, Indiana University and UNC Chapel Hill, each of which has already completed or is committed to completing by May 2014 both the faculty and student surveys. Our panel starts with Roger C. Schonfeld of Ithaka S+R, who presents findings on differences between students and faculty members and some broad differences across institution types (research universities, teaching institutions, etc.). Then Andrew Asher of Indiana University and Heather Gendron of UNC Chapel Hill each present on some of the surprising similarities or noticeable differences in their findings and some specific aspects of their institutional contexts that may help to explain these. Panel discussion focuses on some of the research questions that our analysis may raise for the library assessment community.

In addition to panel discussion, we ensure significant time for Q&A and discussion with all attendees. This session is valuable for librarians interested in the practical question of how best to focus their assessment strategy to maximize its local impact in understanding their institution’s unique positioning.

—Copyright 2015 Roger Schonfeld, Andrew Asher, and Heather Gendron
ABSTRACT
Because of the widespread proliferation of survey software and the seeming ease of writing questions and getting responses, the long established science of survey design and methodology is often overlooked completely. In this paper covering our lightening talk, we discuss the collaborative process involved in implementing the Ithaka S+R Local Faculty Survey at Baylor University. We briefly cover the “best practices” elements of survey methodology that were and are important when using surveys to inform data-driven strategic planning for libraries. In particular, we focus on the methodology for implementing a survey in order to maximize response rates for one population of library users in particular: faculty members.

Introduction
Surveys have become so commonplace that it is easy to neglect good methodology and good survey construction. Online surveys are certainly thought to be the least expensive and easiest way to get answers, but response rates are dropping every year. Reliable results are hard to come by if response rates are low. As response rates decline, the likelihood of non-response bias rises. The effort involved in using good methodology and a little creativity pays off in better numbers and in more reliable results. This overview of our lightening talk presents the methodology that was successful in getting one of the highest response rates in the fall 2013 implementation of the Ithaka S+R Local Faculty Survey. The only university who had a higher response rate followed the methodology outlined in this paper.

Survey Methodology: What’s the Big Deal?
Surveys are an invaluable tool based on scientific methodology related to both the design and implementation stages. They are relatively low cost, easy to administer, and provide quantitative data. While it is well known that survey response rates are declining industry-wide, that makes it even more important to rely on good methodology to gather and interpret survey data. The effects of data reliability are studied constantly, so it is important to realize that to generalize results, you may need to employ some statistical methods to ensure that your results accurately represent your population.

Regarding non-response bias, it is not uncommon in online surveys to get a 20–30% response rate. As researchers and assessment practitioners, we ask ourselves, what are the responses that we did not get? Would those non-response answers skew our results? Have we truly gotten a clear picture of the population with regard to all our questions? This is non-response bias, and it is a serious matter. It may be beneficial to think of the non-response rate to understand the importance of best practices.

Imagine that presenting results on the 15–20% of the population you surveyed only to find out that the remaining 80–85%, the vast majority of your population, felt entirely differently. This is just one aspect of your methodology that could result in disastrous misinformation upon which your library depends for data-driven strategic planning. In this limited space, it would be impossible to cover weighting and other statistical methods we use post-hoc to ensure our conclusions represent the population we are surveying. Our paper thus focuses on using the best and most rigorous methodology known before or during the survey cycle in order to get the best response rate possible.
It is also worth emphasizing that the reality is that response rates are declining drastically, and this is an industry-wide phenomenon (not specific to any population, faculty members included). However, surveys are useful even with a low response rate. Since low response rates are the norm, we must also find other ways to scientifically demonstrate that survey results are valid. For example, if a survey with a low response rate (i.e., high non-response bias, predicts population-level shifts/behaviors) then it could be said to be valid or representative. In other words, predictive accuracy should be considered as a way to offset uncertainty regarding high non-response bias, although predictions rely on trend or longitudinal data (i.e., benchmarks tracked over time).

Survey Methodology: Best Practices and Implementation Tips
The steps outlined in this section are drawn from well-researched and published best practices, which can be critical to reliable results. In addition, after fielding the Ithaka S+R Faculty Survey locally at dozens of institutions in the US and internationally, we have been able to identify specific practices that have worked well among most participating institutions to increase the level of response. In addition, there are a few steps that are especially important for a successful survey project, and we focus on the methodology of the local implementation at Baylor University as an illustrative example, which achieved a 33% response rate to the Ithaka S+R Local Faculty Survey.

Buy-in: Utilizing Liaison or Subject Librarian Networks
In general, it is important to involve librarians and library staff members or other stakeholders who have a working relationship with respondents. Utilizing liaison or subject librarians provides a channel to communicate with faculty members and distinguish the survey as scientific research, not just another poll. This can strengthen the relationship between faculty members and the library by illustrating that the library engages in scientific research to support faculty members—the scientific nature of a properly implemented survey is something that faculty members appreciate and can relate to.

With the creation of Liaison Services at Baylor, library professionals geared toward faculty members’ needs were key stakeholders in the success of this particular survey. Liaisons are the front line contacts between faculty members and the library. Thus they can grow their relationships and ability to serve greatly by having the knowledge of how faculty members operate at work. Meeting with the liaisons, asking them to help promote the survey with the chairs of their respective departments is a link to the library that can be very beneficial, especially with more junior faculty members whose link to the library may be entirely facilitated via technology and who may not be aware of the human infrastructure behind that online link that enables and facilitates their research and teaching.

Getting liaisons’ services into the process by asking them to write a personalized invitation to their department chairs created internal buzz and provided an opportunity to explain to the liaisons the benefit to them of truly knowing their faculty members’ processes better. In return for their efforts, they received department or subject-specific results from the survey. In general, many faculty survey institutional participants have experienced a high level of success utilizing department liaison or subject librarians to reach out to faculty members and department chairs for support in promoting the survey.

Outreach and Marketing
Pre-survey communications can be vital in promoting awareness of a survey on campus. Elements of pre-survey marketing include: the design of invitations, the use of incentives, the signatory on the invitation, the timing of the invitations, and the number and mode of reminders. Indeed, the most significant opportunities for you to influence the response rate at your institution are in the communications that are sent to or marketed to your invitees.

It is thus important to create a team to promote and coordinate survey communications. Baylor had the benefit of a marketing department located in the library, and they contributed to the implementation by designing the e-mail invitations, determining and obtaining permission regarding the signatory for the first and second invitation, setting the timing of the invitations down to the day and hour, and creating a snail mail postcard reminder as an additional means of communication.
Invitations and Reminders
Another main issue to consider is under whose signature the invitations and reminders should come. In some cases, the chief academic officer, library director, faculty senate chair, or other campus-level individual can effectively reach the broadest possible group. In other cases, a more personal note from a dean or department chair is more effective. It can also be effective to utilize one approach for the invitation and a different approach for the reminder. The subject line of the e-mail and the signatory are two important factors in determining whether invitees will open the e-mail message.

Once respondents open the e-mail invitation, the message text matters. In our experience, longer invitation e-mails tend to be the most effective in garnering higher response rates (i.e., two-thirds to three-quarters of a page of text). The text should clearly explain why you are implementing the survey and what you hope to do with the findings. This is an opportunity to mention specific strategic initiatives, campus collaborations, or consortia efforts, if appropriate. If you plan to provide any incentives for participation, indicate those in the invitation. We have found that reminding faculty members to participate three times over the course of your survey is the most effective number of reminders. In our experience, reminder e-mails prompt about as many responses as an initial invitation.

In addition to e-mail, you may also wish to utilize in-person faculty meetings, newsletters, blogs, social media, and other mechanisms for communications with faculty members to provide advance notice about the project and its purpose.

Incentives
Another issue to consider is the use of incentives to bolster response rates. Offering an incentive, such as an invitation to a presentation or workshop of the survey findings or a lottery for a gift certificate or other high-value item, has the potential to significantly increase response rates, and this is especially the case for larger institutions.’ Another option involves offering additional incentives or increasing the value of an incentive at the reminder stage(s). Baylor offered a coupon for a free coffee at any ARAMARK campus dining location (including a Starbucks) to all respondents who completed the survey, which was very well received (94% of respondents who completed the survey redeemed the coupon). Other faculty survey participants have effectively offered library-themed incentives such as a chance to win a framed print or an item from the library’s special collection.

Concluding Remarks
In this paper we have provided a brief overview and rationale for using “best practices” to bolster response rates, in particular for surveys of faculty members, based on our experience in fielding the Ithaka S+R Local Faculty Survey at dozens of institutions. We provided an overview of the steps taken during the Baylor University implementation, which serves as a case study demonstrating that following best practices and also using creative recruitment techniques is highly effective. In addition, following best practices methodology provides a strong basis for making real changes in response to survey results.

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Endnotes


Halt! Who Goes There? Assessing Library Use with Turnstile Data

Susan Bailey and Megan Slemons
Emory University, USA

Abstract
At Emory University’s Robert W. Woodruff Library, users must swipe their Emory ID cards to enter the building turnstiles. These swipes grant entry and capture the card’s ID. Several units within Emory’s Library and Information Technology Services collaborated with the Emory Card Office and Emory Shared Data to be able to link these card swipes to more detailed demographic information about library users, such as class standing and department. An interactive dashboard was then developed to allow for a variety of queries, reports, and visuals to be generated with this data. When completed, this tool will be used by librarians and administrators to better understand who is using the library and make data-driven decisions about changes in outreach, hours and staffing, collections, and services.

Background
In early 2012, Charles Forrest, director of library facilities at Emory University’s Robert W. Woodruff Library, called together a group of staff to begin discussions on getting detailed gate entry data. The group included Terence Jefferson, the library’s security manager, and Susan Bailey, library assessment coordinator. Woodruff Library users swiped their Emory Card at turnstiles to obtain entry into the library. Data on those swipes was returned to the library from the Emory Card Office in a file that was processed further by library security staff to provide monthly and annual summary data. The following table shows a typical annual report prepared by security.

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We did not know whether the person entering was faculty or staff, student or researcher. Yet, institutional research was able to return a file relating to survey respondents that provided the school, department, status, level in school, and more each year when we conducted our annual library survey. That detail allowed us to better analyze how we were or were not serving the needs...
of library users. We wanted to be able to have similarly detailed data about people entering the library. After Emory’s assessment coordinator attended a meeting at Georgia State University and learned about their card swipe data project, a renewed initiative to obtain detailed card swipe data was begun in April/May 2012.

**Literature Review**

The original inspiration for our Library Use Dashboard project at Emory was a similar project by our neighbors at Georgia State University (GSU). Jennifer Jones, assessment and user experience librarian at GSU, realized the potential of linking the ID numbers from card swipes with demographic information associated with each university affiliate. Jones emphasizes the importance of collaboration and encourages assessment librarians to “make it a priority to be aware of data being produced and made available by other campus units that could be useful to the library”.

Jones also explains that using such a tool is easiest when done regularly, so it may be best to have just those familiar with the dashboard run reports at the request of other interested parties. This is a valuable insight as we continue to decide which individuals should have access to the system at Emory. Jones also provides a list of the demographic variables that are available to view for each library user in the GSU dashboard, which helped us consider what data we might like to see at Emory.

We were also inspired by another of our neighbor universities in Atlanta, the Georgia Institute of Technology. Georgia Tech has a library data dashboard that is publicly accessible and contains summaries of several key variables related to library use, including gate count. We liked the idea of a dashboard and wanted to take it a step further to create an interactive interface that could be used by librarians and administrators to extract precisely the data they need.

Emily Morton-Owens and Karen Hanson wrote about their experience creating a library statistics dashboard at New York University Health Sciences Libraries. They built a dashboard that would allow for a single access point for a variety of data and would be interactive and self-updating. Their hope was that the dashboard would allow for “more agile response to problems and opportunities” and data-driven decision making. While their dashboard is meant for all types of library data and only includes total gate counts without the demographic information link, they offered insight into designing a useful tool with a focus on simplicity and explained the technical processes they used to import and display the data.

**Getting the project off the ground**

The library initiative began with mostly questions. What was required to get the data we wanted? Who could grant us access to the data? Who had the technical expertise to get and store the data? How would we interact with the data?

From meetings with the Emory Card staff and Emory Shared Data staff, we understood that the Emory Card number was the only identifier returned from the card swipe. The Emory Card Office could provide the school of the person entering but did not link to any additional demographic data. The additional data was held by Emory Shared Data within PeopleSoft, so they had to agree to link the Emory Card number to the additional demographic information. We needed the information in a format that we could process and utilize.

The initial discussions centered on the question, what data do you want? We wanted everything we could get! Further discussions led us to limit our request to:

- Date and time (hour, minute) of the visit
- Status: the visitor’s primary affiliation with Emory (student, faculty, medical resident, etc.)
- School Affiliation
- Faculty Rank
- Department
- Year in school
- Degree program
- Major
- Residence hall resident

In the end, we selected data elements that we believed we could easily justify as valuable information for understanding user behavior.

Periodic meetings between library staff, Emory Card staff, and Emory Shared Data staff continued. The initial concept design involved having pre-approved library staff who could log into Emory Shared Data and have a view of the selected data elements. We could develop a process for downloading Excel files of the data for further...
processing, analysis, and storage. We recognized that once we had agreement among the parties for us to get the data, we needed IT staff who could retrieve and manipulate the files, store them, and make them available to us. IT staff attendance at one meeting provided us with a contact name that was the right fit for the job—Mike Mitchell, head of Emory Libraries’ software engineering team. Once we identified Mike and began talking with him about our goals and needs, he quickly engaged with the ideas and began to think about the myriad possibilities beyond what we had imagined. Rather than simply having a view of approved fields within the university data system, he and his staff envisioned and began bringing to life a web application through which users could interact with the data.

As the library was becoming more integrated with University Technology Services, we were adopting many of the well-developed business practices associated with project management. With all the players in basic agreement over the concept and access to the data, we submitted a business case for the project to the authorizing parties.

Among the basic assumptions of the project were:

• Once developed, the processes for collecting, storing, and reporting the data would not be labor-intensive.
• Data to be stored would be aggregate data without personal identification of individuals.
• Secure storage of the information could be achieved through LibPAS, if desired.

The project received the needed approvals, and IT staff began their work!

The project was initiated on behalf of the Robert W. Woodruff Library. Emory has five main libraries (Woodruff, Health Sciences, Theology, Law, and the Oxford College Library) along with a number of additional service locations. At the project’s start, not all libraries had entry turnstiles, and there was no attempt to create a libraries-wide system. This is typical of activity at Emory, where the libraries collaborate on some systems like the online catalog, but have separate processes for many of their unique activities. Since the project began, turnstiles have been installed in the Health Sciences and Theology Libraries, and data is also available for the Law Library. As the project has developed, data for some of those libraries has been incorporated into the application. Decisions remain about who will be included and who has access to the data as we move forward.

Developing the dashboard
We were fortunate to have access to the team of software engineers to bring the Library Use Dashboard to life. While the dashboard was one of many projects they were working on concurrently, having dedicated developers working steadily on the project began to move things forward quickly. One thing that worked especially well for the development team was easy communication between stakeholders. The project’s primary developers were Jay Varner, who worked on the database structure, and Kevin Glover, who designed the user interface. They were able to collaboratively develop, rather than having to exclusively format the interface to match the data structure or the data to fit in the interface. It was also easy for the developers to communicate with the project owners to test features and discuss options along the way.

There were some challenges as well. One of the biggest challenges was determining how to construct and clearly define each of the queries in the dashboard. It was rarely simple to determine exactly which variables to use, at which time increments, among other factors. Not knowing the query structures up front made it difficult to request the needed data from Emory Shared Data. It also made designing the interface a challenge. Prior to this project, we only knew the school of the person, such as “School of Medicine.” Now, we know about 150 sub-divisions within the School of Medicine. It was a challenge to determine what level of detail to work with and to allow for viewing data both in detail and in a more aggregate way.

Another challenge was that of joining data from two different sources—ID numbers from the Emory Card Office and detailed demographic records from Emory Shared Data. As would be expected, these records did not match up perfectly. We experienced data reliability issues, including:

• users with multiple roles on campus showing up as multiple entries rather than a single entry;
• failing to receive data for users who were not currently enrolled in classes (in a retrospective file); and
• failure of data to be retrieved and loaded on some days, and the developers having to request historical data, which compromised on some detail.

A final challenge was anonymizing the data. We needed to maintain access to individual card ID numbers, in order to allow for showing total entries versus unique entries. However, none of the users of the dashboard can access any ID numbers or identifying information.

Technical details
The developers used a MySQL database to join the tabular data from the Emory Card Office and Emory Shared Data and format it in a way that would work with data visualization platforms. According to Kevin Glover, they “developed a Django application to transform and server the data in the form of a RESTful API and an Ember.js web app dashboard for easy digestion.” The developers chose the Ember.js framework (http://emberjs.com) to build the dashboard, based on its capability to load and display JSON retrieved from a server. Glover explains, “Using [Ember.js'] built-in features, we created bookmarkable URLs that update dynamically when users select filters without reloading the page or breaking the back button.” They also used an open chart library called Highcharts (http://www.highcharts.com) that is written specifically for Javascript and includes “a rich set of features, including dynamic charts, external data loading, and zooming functions,” according to Glover. Combining these two resources resulted in an easy to use, interactive dashboard. The code used to build the dashboard is freely available on GitHub.

Library Use Dashboard: A preview of the test environment
The Library Use Dashboard is still in development and therefore not at the full production stage to use for decision making. It is available to the developers and the data use team for testing and modification before its official release, which should be by January 2015. As stated earlier, the dashboard is only accessible via login, and permission policies have yet to be re-examined in light of the current product design.

Figures 1–4 show examples of the dashboard’s functionality.

Figure 1: The Library Use Dashboard allows us to compare data across time and between libraries. The user can select a custom date range to the right, and the filter icon on the upper left expands to show all filtering options.
Figure 2: The dashboard creates visuals and reports for different demographic variables, here students by major.

![Dashboard Image]

Figure 3: The dashboard can compute averages, for example average library entries between 11 a.m. and 2 p.m. for the past two months. The dropdown menu to the right of the chart is expanded to show download options.

![Dashboard Image]
A word on scope creep

This project has expanded far past its initial scope, which has resulted in additional useful capabilities, but has also brought additional challenges and far more staff hours. This project, which originally included only Woodruff Library, now also includes the Law and Health Sciences Libraries. The Theology Library has just moved into a new building with entry turnstiles and has expressed interest in participating. That would only leave Oxford out of the five main Emory Libraries, but they do not have entry turnstiles and therefore no data at this time.

Another area where we have experienced scope creep is in what functionality actually needs to be built into the system. The list of built-in queries has been steadily expanding, as more stakeholders get involved and there are more ideas for things that would be “cool” to see in the dashboard but which are not necessarily essential functions. We have added the option to export the raw data as a CSV, so that if a user needs a report that cannot be automatically generated, they can manipulate the data on their own in Excel.

Decisions still to be made

There are still some issues we need to consider as we move forward. First, visitors are still signed in on paper at the security desk. We are exploring ways to integrate this data to get a more complete picture of library use.

Second, we recognize that we are only capturing who enters the library, not how long they stay or what they do. We have considered incorporating data about classes that meet regularly in the library, which would help explain seemingly high entry counts for certain departments. We could also include information about events hosted in the library. However, this raises the question of how much of why people are coming in we want to try to capture. We do not know many other possible reasons for entry such as using the Business Library (which does not have separate turnstiles), visiting the coffee shop downstairs, using a computer, or finding a quiet study space. We have yet to decide if it would be useful to capture what we can or to simply go with the raw gate counts and understand that many factors influence those numbers.

Third, we currently have the entry data both in the Library Use Dashboard and in LibPAS, our central tool for management and reporting of library statistics. We can see uses for having the entry data available to query in the same system as other library indicators, and we feel there may be different user groups for the two tools. However, we have yet to determine if it is worth
the significant effort of manually entering the data into this second system. There is the possibility of automatically importing the data into LibPAS, which would make it worth the effort to maintain both collections.

A final major question to consider going forward is who really owns this project now. As more parties have become involved and the scope has grown, it is unclear who is the “owner” of this collaborative project and therefore responsible for maintenance and updates.

Conclusion
The ongoing creation of the Library Use Dashboard has been the result of successful collaborations between many campus units. Face-to-face meetings and regular communication between stakeholders have been incredibly valuable for a project of this duration, scope, and complexity. The Library Use Dashboard is shaping up to be a valuable tool for decision-making at the Emory Libraries.

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Endnotes

2. Ibid.

3. Ibid.


Expressing Value in a Changing Budget Climate

Chad Boeningger, Deborah Daniels, Jeff Ferrier, Sara Harrington, and Janet Hulm
Ohio University, USA

Abstract
This paper discusses the work and findings of a task force charged by the dean of the Ohio University Libraries to analyze and express the value of the library on a campus moving to a Responsibility-Centered-Management (RCM) budgeting system. Using a wide range of data sets, the task force analyzed collections and materials, staff, and services for each academic college on campus. The task force found that the total value returned on investment to each college exceeded the contribution of that college. This paper offers a range of strategies for gathering and analyzing library expenditures, library use, and other data to communicate the value of the library to the larger campus community.

Purpose
This paper discusses the work of the Expenditures and Value in Libraries Task Force at Ohio University Libraries. Ohio University is classified by the Carnegie Foundation as a “high research activity” university. The University enrolls over 22,000 residential undergraduate and graduate students on its main campus in Athens, Ohio, nestled in the foothills of the Appalachian Mountains. The Ohio University Libraries is a member of the Association of Research Libraries (ARL).

The dean of libraries charged the task force to analyze and express the value of an academic research library on a campus moving to a new budgeting system, one which places greater expectations of accountability on the library. The task force assessed the allocations of library staff, collections, and operations (facilities and technology) to each academic department, in order to arrive at a college-by-college cost accounting for library expenditures based on Responsibility Centered Management (RCM) budgeting models. This effort also supported the libraries’ strategic plan to “communicate consistently with stakeholders to convey the value of libraries” and to “manage materials and metadata to maximize return on university investment.”

Background
Ohio University shifted to a Responsibility Centered Management (RCM) budgeting system in 2013. RCM is a form of incentive-based budgeting, which decentralizes decision making, placing greater authority and accountability for budgeting in the hands of faculty (often deans) and administrators. As Edward Whalen (2002), a scholar of RCM, has written, “RC[M] spreads around the pain—and the opportunity for initiative—and the challenge—and the exhilaration—and the incentives—and the responsibility with the authority.” RCM divides university entities into responsibility centers that are categorized either as revenue-generating centers (known as “revenue centers”), such as academic departments or colleges, or residential housing, or as “cost centers,” such as libraries, child development centers, or museums, which do not generate revenue sufficient to cover their expenses.

In a RCM system, revenue centers maintain authority over the revenue that they generate, and are responsible for the direct and indirect costs that they incur. Cost centers receive allocations (colloquially referred to as “taxes”) from revenue centers for the provision of goods and services. In RCM, revenue centers enjoy independence with regard to how their budgets are spent, allowing significant latitude and initiative for the faculty and administrators who lead revenue centers. Under the previous university budgeting model, the libraries budget was allocated from the general fund and increased incrementally each year to account for raises (or cut when tuition and subsidy revenues were down). Any additional funding that came from the provost’s office was transferred as a base from the provost’s budget, which was also allocated from the general fund. Under RCM, the possibility exists that the dean will have to negotiate with the leader of each responsibility
center to determine library funding in any particular fiscal year. For this reason, academic libraries operating in a RCM model must fully assess and understand expenditures in order to be able to effectively communicate the value of the library to the academic colleges, as well as to the larger campus community. Concurrent with this transition, the library profession has for several years been examining how best to demonstrate and champion the value of the library to the academy. This is perhaps particularly important at state-assisted institutions, which function against a background of rising college costs and diminishing state funding.

Design/Methodology/Approach

**Figure 1. Proposed Library Contribution under RCM of Ohio University Academic Colleges.**

<table>
<thead>
<tr>
<th>Colleges</th>
<th>Proposed Library contribution</th>
<th>FY12 Acquisitions allocation</th>
<th>FY12 allocation to proposed contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTS &amp; SCIENCES</td>
<td>$2,681,245</td>
<td>$1,821,905.53</td>
<td>67.95%</td>
</tr>
<tr>
<td>BUSINESS ADMINISTRATION</td>
<td>$1,448,318</td>
<td>$275,839.81</td>
<td>19.05%</td>
</tr>
<tr>
<td>COMMUNICATION</td>
<td>$1,364,272</td>
<td>$222,645.01</td>
<td>16.32%</td>
</tr>
<tr>
<td>EDUCATION AND HUMAN SERVICES</td>
<td>$1,266,471</td>
<td>$205,915.51</td>
<td>16.15%</td>
</tr>
<tr>
<td>ENGINEERING/TECHNOLOGY</td>
<td>$1,067,013</td>
<td>$473,506.64</td>
<td>44.38%</td>
</tr>
<tr>
<td>FINE ARTS</td>
<td>$639,005</td>
<td>$271,271.59</td>
<td>42.45%</td>
</tr>
<tr>
<td>HEALTH SCIENCES &amp; PROFESSIONS</td>
<td>$3,538,419</td>
<td>$328,332.36</td>
<td>9.84%</td>
</tr>
<tr>
<td>INTERNATIONAL STUDIES / EDUC ABROAD</td>
<td>$103,296</td>
<td>$165,552.77</td>
<td>160.27%</td>
</tr>
<tr>
<td>UNIVERSITY COLLEGE</td>
<td>$1,016,474</td>
<td>$4,500</td>
<td>0.44%</td>
</tr>
<tr>
<td>HONORS TUTORIAL</td>
<td>$3,397</td>
<td>$0</td>
<td>0.00%</td>
</tr>
<tr>
<td>VORNOVICH</td>
<td>$85,933</td>
<td>$0</td>
<td>0.00%</td>
</tr>
<tr>
<td>MEDICINE</td>
<td>$442,308</td>
<td>$0</td>
<td>0.00%</td>
</tr>
<tr>
<td>ELEARNING</td>
<td>$67,012</td>
<td>$0</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>$13,503,166</td>
<td>$3,760,578.92</td>
<td>35.57%</td>
</tr>
</tbody>
</table>

Figure 1 demonstrates the challenge of using collections spending alone to demonstrate value to each college—the college’s proposed contribution under RCM may exceed by a significant margin the library’s spending on resources for that college. The first order of business was therefore to define how ‘value’ would be defined as a part of the task force’s work. The group considered both value in use, which represents intrinsic worth or usefulness (and is sometimes defined as contingent valuation), and value in exchange, which is the marketplace for a good or service. In most instances, the task force used the market price definition for calculations to determine value.

Potential Findings

**Facilities**

The most basic calculation was in the area of facilities. 18.5% is taken off the top of the allocations to all responsibility centers in order to support university facilities overhead. The task force simply distributed the 18.5% that the libraries are charged across the colleges based on their total FTE for faculty and students. This is the same basis used to allocate the funding for the libraries base budget across all the revenue centers.

**Staffing**

Staffing value calculations required more effort. Using data from a recent compensation study performed by Ohio University’s human resources department, the task force divided each staff FTE according to four areas of focus: subject librarians,
collections, information technology (IT)/public services, and administration/operations. Because task force members wanted to use the market value, not the much lower actual value, for administrative professional staff, 2012 ARL Salary Survey average salary for administrative professional positions was employed in calculations. Paraprofessional salaries were gathered using the university market point, and student wages were actual figures. The use of different sources of data for wages represents one potential weakness of the task force’s analysis.

In distributing the value across colleges, subject librarian FTE value was distributed directly to the college(s) the subject librarian served. Because collections work supports what the libraries purchase for the colleges, this value was distributed by the percentage based on the libraries’ allocation formula. Information technology (IT)/public services, as well as administration/operations, were distributed to the colleges based upon their RCM contribution percentage.

**Collections**
Collections value was calculated by using the total amount allocated for materials for each college, combined with the additional value of consortial journal purchases. The libraries’ allocation formula is based on supply, or the cost of books and journals in the field, and demand, the weighted FTE of faculty, graduate, and undergraduate students in the department or college.

Since 30% of the acquisitions budget is spent on purchasing via OhioLINK, Ohio’s Academic Library Consortium, 90% of which goes to the Electronic Journal Center (EJC), the task force needed to find a way to calculate the added value of consortial purchases and distribute this back to the colleges. To arrive at this calculation, the task force captured all the records in the library catalog for which we have current OhioLINK consortial journal holdings and their call numbers, eliminated titles with no use, and, using the call numbers, assigned a single subject to each title. Using the assigned subject, each journal title was assigned an average cost based on an annual survey article. The total prices were summed for all holdings, and the libraries’ invoiced amount for OhioLINK consortial journal holdings was subtracted from the total market cost to determine the libraries’ added value.

**Figure 2. Ohio University Libraries FY2012 Library Value.**
As Figure 2 illustrates, based upon our calculations with FY 2012 budget information, Ohio University Libraries returned an additional 6.9 million dollars in value back to the university.

**Figure 3. Ohio University Academic Colleges Proposed Contributions and Total Library Value.**

<table>
<thead>
<tr>
<th>Colleges</th>
<th>Proposed College Contribution</th>
<th>% of contribution Athens only</th>
<th>TOTAL LIBRARY VALUE</th>
<th>FOR CONTRIBUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTS &amp; SCIENCES</td>
<td>$1,681,293</td>
<td>19.86%</td>
<td>$5,282,422</td>
<td>197%</td>
</tr>
<tr>
<td>BUSINESS ADMINISTRATION</td>
<td>$1,448,338</td>
<td>10.73%</td>
<td>$2,031,603</td>
<td>140%</td>
</tr>
<tr>
<td>COMMUNICATION</td>
<td>$1,364,272</td>
<td>10.10%</td>
<td>$1,909,717</td>
<td>140%</td>
</tr>
<tr>
<td>EDUCATION AND HUMAN SERVICES</td>
<td>$1,266,471</td>
<td>9.38%</td>
<td>$1,745,979</td>
<td>138%</td>
</tr>
<tr>
<td>ENGINEERING/TECHNOLOGY</td>
<td>$1,067,023</td>
<td>7.90%</td>
<td>$1,800,201</td>
<td>169%</td>
</tr>
<tr>
<td>FINE ARTS</td>
<td>$639,005</td>
<td>4.73%</td>
<td>$1,128,519</td>
<td>177%</td>
</tr>
<tr>
<td>HEALTH SCIENCES &amp; PROFESSIONS</td>
<td>$3,338,429</td>
<td>24.72%</td>
<td>$4,307,851</td>
<td>129%</td>
</tr>
<tr>
<td>INTERNATIONAL STUDIES / EDUC ARMS</td>
<td>$103,246</td>
<td>0.76%</td>
<td>$337,366</td>
<td>365%</td>
</tr>
<tr>
<td>UNIVERSITY COLLEGE</td>
<td>$1,016,474</td>
<td>7.53%</td>
<td>$1,208,946</td>
<td>119%</td>
</tr>
<tr>
<td>HONORS TUTORIAL</td>
<td>$5,297</td>
<td>0.02%</td>
<td>$5,879</td>
<td>118%</td>
</tr>
<tr>
<td>VOINOVICH</td>
<td>$65,933</td>
<td>0.49%</td>
<td>$77,580</td>
<td>118%</td>
</tr>
<tr>
<td>MEDICINE</td>
<td>$442,303</td>
<td>3.28%</td>
<td>$520,433</td>
<td>118%</td>
</tr>
<tr>
<td>E-LEARNING</td>
<td>$67,032</td>
<td>0.50%</td>
<td>$78,873</td>
<td>118%</td>
</tr>
<tr>
<td>ATHENS CAMPUS TOTALS</td>
<td>$13,503,166</td>
<td></td>
<td>$20,473,378</td>
<td>152%</td>
</tr>
</tbody>
</table>

Figure 3 indicates the value returned by college. Based upon our calculations, Ohio University Libraries returned an additional 52% to the campus community.
Figure 4 demonstrates how facilities, collections, and services are broken down by college. The green hash mark shows the RCM contribution; in most cases, it barely covers the cost of materials. In conducting a study of value such as this, the task force hoped to demonstrate that value cannot just be defined by the materials that the libraries’ purchase. Staffing and services add significant value, but, as the reader can see, the cost for staff to maintain the collections and materials that the libraries’ buy is relatively modest.

In order to convey the value of the physical library facility to the colleges, the task force collected and analyzed available data such as logs for student printing, login IDs for group study room usage, and wireless login information. Even though many colleges at Ohio University maintain their own computer labs, the printing in Alden Library, Ohio University Libraries’ campus library, is significant. Wireless data trends closely to student printing, which provides another data point to show who is using the libraries.

Since the libraries do not currently collect login information for e-resources, the only way for the task force to measure collection use by college at this time is using circulation data. The task force gathered checkout data by ID for an entire year. Then, with the help of the university registrar’s office, the task force associated each person with their college of record to demonstrate collection use. The resulting number of checkouts per college was then distributed to the colleges as a percentage of the overall total. The task force also analyzed LibraryH3lp chat usage logs as one way to demonstrate who is using select library services. The task force gathered all chat transactions from on-campus IP ranges, assigned each transaction to a college using the campus building IP table, then tallied total transactions and transaction time by college.

Finally, in order to obtain another data point to demonstrate who is using services of subject librarians, the task force captured hits of all LibGuides and then associated each LibGuide with specific departments and colleges.

**Practical Implications and Value**

This essay presents just a glimpse of the work the task force undertook. When, as task force members, we began this project, we did not know quite what to expect (or what to do). Task force members offer the following recommendations to other library
organizations who may wish to conduct similar examination of value:

- Assemble a diverse group of hardworking and talented staff emerging from a range of functional areas and perspectives.
- Consider and analyze existing data in creative ways.
- Partner with data gatekeepers, and build significant time into the process to do so.
- Do not create a barrier for users with regard to collections or services in order to collect data, even if such data might be potentially useful.
- Acknowledge that findings may be received and interpreted by stakeholders and other interested parties in ways that were not recognized or intended.
- Create a meaningful communication plan to share the information discovered with a range of campus communities and stakeholders.

The task force is currently preparing to re-run the calculations discussed above with fiscal year 2014 data. In addition, the task force is looking for new sources of existing data that may complement, expand, or extend the information gathered and conclusions reached. That said, the task force is also committed to a practical approach that can be replicated, and therefore will continue to rely on data that is routinely and regularly collected. As the university moves into a fuller implementation of the RCM budgeting model, the task force will plan to continue to share and communicate to the campus community the understanding of the added value the Ohio University Libraries offers to academic departments and colleges of Ohio University as demonstrated by the task force’s work. This is an important effort, as librarians increasingly forge evolving partnerships with faculty, which necessitates a greater awareness on the part of librarians as to what colleges and departments contribute to the libraries, as well as what faculty and administrative expectations of the library might be in the future.

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Endnotes


Bibliography


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Thunderstruck! An “En-Lightning” Look at Recharging Existing Library Data to Electrify University Administration

Allison B. Brungard, David A. Nolfi, Marcia E. Rapchak, Bridget Euliano, Tracie J. Ballock, and Joseph Nelson
Duquesne University, USA

Abstract
Duquesne University consistently ranks among the nation’s top Catholic research universities, but how do its libraries measure up against peer institutions? This paper seeks to demonstrate that library and information related trends among peer institutions can provide a frame of reference for university administrators. The authors show that libraries can recharge standard assessment data to generate striking information at the institutional level, thus getting the attention of university administrators.

The library assessment coordinator used data from the ACRL and NCES Academic Libraries surveys to compare Duquesne libraries with libraries from 13 Catholic doctoral research institutions chosen by administrators and routinely used for benchmarking. The data and charts emphasized indicators that administrators value, such as a collection size and expenditures, versus number of degrees awarded. Used discriminately, otherwise mundane reports, such as ACRL and NCES, can shock administrators into recognizing that the library is an essential indicator of a university’s strength. Reframing existing library data within a larger context provides a sustainable, effective, and easy way for inviting university administrators to the table and ultimately emphasizes the scope of the research library’s role in the university’s overall assessment.

Introduction
Duquesne University consistently ranks among the nation’s top Catholic research universities,\(^1\) but how do its libraries measure up against peer institutions? This paper seeks to demonstrate that comparing standardized library data among peer institutions can enlighten and perhaps motivate university administrators. Libraries routinely collect and report statistics; however, much of this abundance of data barely makes a rumble outside the library building. The authors show that libraries can present standard assessment data to generate captivating information at the institutional level, thus getting the attention of university administrators.

Duquesne University is an urban, private, Catholic university located in Pittsburgh, Pennsylvania. Two libraries, the Gumberg Library and the Duquesne University Center for Legal Information, serve ten schools of study and 9,171 full-time equivalent (FTE) students. Gumberg Library’s Assessment Committee (LAC) is comprised of six professionals, representing major functional areas of the library—acquisitions, circulation management, collection management, instruction, and reference. Through various means of communicating data to the administration, the LAC strategically demonstrates the value of the services we offer, how best to deliver those services, and what changes need to be made to improve existing services. A common question is, “What tools can help us measure specific library outcomes related to the university’s strategic priorities?” The LAC’s approach in this case was simple yet effective. University administrators have already identified the strategic initiatives and priorities that are important to them and the library assessment coordinator in turn responded by highlighting those areas and how the libraries fit within this overarching structure.

Design/Methodology/Approach
Gumberg Library’s assessment coordinator used data from the Association of College and Research Libraries (ACRL) and National Center for Education Statistics (NCES) Academic Libraries surveys from 2012 (the most recent data available at the time) to compare Duquesne’s libraries with libraries from thirteen Catholic doctoral research institutions chosen by administrators and routinely used for benchmarking. Categories explored included collections, total expenditures and staff,
services and collection circulation, and doctoral degrees. The data was presented to match the university fact book in layout, formatting, and color to emphasize that it was part of the larger body of comparison data.

Table 1
Example from Duquesne University 2013 Fact Book

<table>
<thead>
<tr>
<th>Carnegie Classification</th>
<th>Professor</th>
<th>Associate Professor</th>
<th>Assistant Professor</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duquesne University</td>
<td>$141.8</td>
<td>$105.7</td>
<td>$93.2</td>
<td>$69.0</td>
</tr>
<tr>
<td>Pennsylvania State University</td>
<td>$128.7</td>
<td>$94.3</td>
<td>$70.5</td>
<td>$55.2</td>
</tr>
<tr>
<td>University of Pittsburgh</td>
<td>$155.8</td>
<td>$114.5</td>
<td>$94.5</td>
<td>$77.8</td>
</tr>
<tr>
<td>Temple University</td>
<td>$124.8</td>
<td>$94.0</td>
<td>$71.0</td>
<td>$55.5</td>
</tr>
<tr>
<td>Duquesne University</td>
<td>$114.5</td>
<td>$82.8</td>
<td>$68.4</td>
<td>$53.1</td>
</tr>
<tr>
<td>University of Dayton</td>
<td>$110.2</td>
<td>$70.0</td>
<td>$58.8</td>
<td>$48.1</td>
</tr>
<tr>
<td>West Virginia University</td>
<td>$109.9</td>
<td>$80.0</td>
<td>$68.3</td>
<td>$54.1</td>
</tr>
<tr>
<td>Saint Joseph's University</td>
<td>$105.8</td>
<td>$76.0</td>
<td>$67.7</td>
<td>$56.5</td>
</tr>
<tr>
<td>Slippery Rock University</td>
<td>$104.7</td>
<td>$94.0</td>
<td>$81.4</td>
<td>$48.3</td>
</tr>
<tr>
<td>West Chester University</td>
<td>$103.3</td>
<td>$82.7</td>
<td>$65.5</td>
<td>$40.6</td>
</tr>
<tr>
<td>Indiana University of Pennsylvania</td>
<td>$102.1</td>
<td>$81.6</td>
<td>$61.1</td>
<td>$51.0</td>
</tr>
<tr>
<td>Allegheny College</td>
<td>$96.3</td>
<td>$73.5</td>
<td>$59.2</td>
<td>$47.2</td>
</tr>
<tr>
<td>Robert Morris University</td>
<td>$97.5</td>
<td>$81.2</td>
<td>$74.4</td>
<td>$49.0</td>
</tr>
<tr>
<td>Gannon University</td>
<td>$87.9</td>
<td>$69.5</td>
<td>$81.4</td>
<td>$51.3</td>
</tr>
<tr>
<td>Saint Vincent College</td>
<td>$80.5</td>
<td>$63.4</td>
<td>$54.8</td>
<td>$51.3</td>
</tr>
<tr>
<td>Washington &amp; Jefferson College</td>
<td>$89.4</td>
<td>$69.9</td>
<td>$55.7</td>
<td>$51.3</td>
</tr>
</tbody>
</table>

Average of Group

|          | $105.8 | $82.2 | $58.6 | $51.5 |
| Difference from Group (Duquesne)

|          | $4.7   | $2.6  | $(0.2) | $1.0  |

1 List of the top 15 institutions where full-time, full-time tenured faculty, in addition to Duquesne for Fall 2012, noted by professor-level salary comparison.
2 Carnegie Classification (basic) categories:
   R1UIH - Research Universities - Very High Research Activity
   R2UIH - Research Universities - High Research Activity
   DRIU - Doctoral/Research Universities
   Master's - Master's Colleges and Universities - Larger Programs
   BaccALP - Baccalaureate Colleges - Arts & Sciences
   BaccALC - Baccalaureate Colleges - Comprehensive

3 Pittsburgh (Oklahoma) campus only

Note: Full-time faculty salary adjusted to a nine-month equivalent salary.

Sources: Enrollment Management Group; AAMC Faculty Salary Survey; The Carnegie Foundation for the Advancement of Teaching
The customized charts combined traditional library statistics, such as collection size and expenditures, with indicators that administrators value, such as degrees awarded. While this analysis was highly focused, the picture offered breadth and clarity. The data showed library usage, level of staffing, and staff productivity at Duquesne University in comparison to its peers.
Table 3
Example of Comparison Chart Submitted to University Administration

<table>
<thead>
<tr>
<th>Reporting Institution</th>
<th>Grad. Class.</th>
<th>Library Volumes</th>
<th>Rank¹</th>
<th>Total Expenditures</th>
<th>Rank¹</th>
<th>Collection Expenditures</th>
<th>Rank¹</th>
<th>Salaries/Wages</th>
<th>Rank¹</th>
<th>Library Staff</th>
<th>Rank¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston College</td>
<td>RU/H</td>
<td>NA</td>
<td>NA</td>
<td>$7,592,316</td>
<td>7</td>
<td>$4,082,074</td>
<td>6</td>
<td>$3,245,160</td>
<td>7</td>
<td>127.00</td>
<td>3</td>
</tr>
<tr>
<td>Catholic University of America</td>
<td>RU/H</td>
<td>2,430,953</td>
<td>3</td>
<td>$8,491,227</td>
<td>6</td>
<td>$4,385,217</td>
<td>5</td>
<td>$3,346,801</td>
<td>6</td>
<td>76.00</td>
<td>8</td>
</tr>
<tr>
<td>DePaul University</td>
<td>DRU</td>
<td>699,758</td>
<td>12</td>
<td>$7,331,974</td>
<td>8</td>
<td>$3,357,067</td>
<td>7</td>
<td>$2,883,429</td>
<td>11</td>
<td>69.00</td>
<td>10</td>
</tr>
<tr>
<td>Duquesne University</td>
<td>RU/H</td>
<td>1,052,093</td>
<td>10</td>
<td>$7,331,974</td>
<td>8</td>
<td>$3,357,067</td>
<td>7</td>
<td>$2,883,429</td>
<td>11</td>
<td>69.00</td>
<td>10</td>
</tr>
<tr>
<td>Fordham University</td>
<td>RU/H</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Georgetown University</td>
<td>RU/VH</td>
<td>3,980,306</td>
<td>2</td>
<td>$15,704,209</td>
<td>2</td>
<td>NA</td>
<td>NA</td>
<td>$12,659,221</td>
<td>1</td>
<td>250.00</td>
<td>1</td>
</tr>
<tr>
<td>Loyola University Chicago</td>
<td>RU/H</td>
<td>1,754,048</td>
<td>6</td>
<td>$18,143,122</td>
<td>5</td>
<td>$4,823,122</td>
<td>4</td>
<td>$3,804,564</td>
<td>5</td>
<td>79.18</td>
<td>7</td>
</tr>
<tr>
<td>Marquette University</td>
<td>DRU</td>
<td>2,107,689</td>
<td>5</td>
<td>$14,645,365</td>
<td>3</td>
<td>$8,066,391</td>
<td>2</td>
<td>$5,136,609</td>
<td>3</td>
<td>111.90</td>
<td>4</td>
</tr>
<tr>
<td>Saint John's University-New York</td>
<td>DRU</td>
<td>710,505</td>
<td>11</td>
<td>$2,514,971</td>
<td>10</td>
<td>$2,978,818</td>
<td>9</td>
<td>72.75</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saint Louis University</td>
<td>RU/H</td>
<td>2,157,214</td>
<td>4</td>
<td>$10,204,092</td>
<td>4</td>
<td>$9,466,520</td>
<td>3</td>
<td>$4,520,932</td>
<td>4</td>
<td>109.00</td>
<td>5</td>
</tr>
<tr>
<td>Seton Hall University</td>
<td>DRU</td>
<td>1,080,519</td>
<td>9</td>
<td>$3,949,298</td>
<td>13</td>
<td>$1,848,728</td>
<td>12</td>
<td>$2,083,685</td>
<td>12</td>
<td>54.00</td>
<td>12</td>
</tr>
<tr>
<td>University of Dayton</td>
<td>RU/H</td>
<td>1,494,093</td>
<td>7</td>
<td>$6,426,946</td>
<td>9</td>
<td>$2,745,298</td>
<td>8</td>
<td>$3,150,050</td>
<td>8</td>
<td>81.00</td>
<td>6</td>
</tr>
<tr>
<td>University of Notre Dame</td>
<td>RU/VH</td>
<td>4,262,336</td>
<td>1</td>
<td>$26,933,516</td>
<td>1</td>
<td>$13,589,145</td>
<td>1</td>
<td>$10,879,916</td>
<td>2</td>
<td>249.00</td>
<td>2</td>
</tr>
<tr>
<td>University of Saint Thomas-Minnesota</td>
<td>DRU</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>University of San Diego</td>
<td>DRU</td>
<td>575,044</td>
<td>13</td>
<td>$4,249,330</td>
<td>11</td>
<td>$2,276,085</td>
<td>11</td>
<td>$1,844,681</td>
<td>13</td>
<td>39.50</td>
<td>13</td>
</tr>
<tr>
<td>University of San Francisco</td>
<td>DRU</td>
<td>1,278,757</td>
<td>8</td>
<td>$5,633,714</td>
<td>11</td>
<td>$2,565,877</td>
<td>9</td>
<td>$2,911,484</td>
<td>10</td>
<td>60.22</td>
<td>11</td>
</tr>
</tbody>
</table>

Average of Group

<table>
<thead>
<tr>
<th>Reporting Institution</th>
<th>1,814,755</th>
<th>9,699,539</th>
<th>4,718,464</th>
<th>4,572,873</th>
<th>106</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference from Group (Duquesne)</td>
<td>-761,656</td>
<td>-2,367,565</td>
<td>-1,351,397</td>
<td>-1,689,444</td>
<td>-57</td>
</tr>
</tbody>
</table>

1. Rank is from 1 to 13. Boston College, Fordham, and the University of Saint Thomas did not provide data to ACR in 2012.

2. Rank is from 1 to 12. Georgetown did not provide data for this indicator. Boston College, Fordham, and the University of Saint Thomas did not provide library data to ACR in 2012.

Findings
One salient finding was that Duquesne ranked low in total salaries/wages for its library staff and in the ratio of library staff member per student but high in the number of reference questions answered and instruction sessions taught. This derived statistic positively highlights staff productivity, but also sheds light on statistics in which the university’s libraries do not compare favorably with peers. In other words, we do more with less. In terms of staffing, Duquesne ranks 10 out of 13. The full-time equivalent (FTE) library staff total is 37 less than the group average. This comparison is notable because Duquesne ranks 3 out of 13 in the number of reference transactions per staff FTE and 5 out of 13 in the number of instruction sessions taught. The data also mitigates judgments about the libraries’ slow decline in reference statistics, since this trend can also be seen among peer institutions. Despite declining reference statistics, we are still answering more questions and providing a consistently high number of instruction sessions per staff member than many of our institutional peers.

Examining where and how much money is spent at other institutions in a side-by-side comparison is revealing. Compared to like institutions, Duquesne ranks third in the number of doctoral degrees awarded, but next to last in terms of total expenditures per doctoral student. This finding is particularly important because the Duquesne University Strategic Plan specifically cites improvement in graduate programs with a special emphasis on PhD programs. This may indicate to administrators that, with its current budget, the library cannot support doctoral students at a level commensurate with our peers. While we try to make up for the lack of library budget with responsive services including interlibrary loan, we still do not have the same level of commitment to library spending as many of the other doctoral granting, peer institutions.

The overall analysis shows that Duquesne’s libraries rank lower in measures related to financial support such as collections, expenditures, and salaries. However, the libraries rank higher on measures related to service, such as the number...
of reference questions answered and instruction sessions taught. Ultimately, we hope that such data will convince Duquesne administrators that by providing further support, we can be of even greater value to the educational mission of the university.

Practical Implications / Value
This project enabled the library to strengthen relationships with other campus units such as Academic Affairs and the Office of Institutional Research. The library assessment coordinator partners with analysts and administrators to design and analyze surveys. Librarians serve on many campus committees including Learning Outcomes Assessment, Information Literacy, Core Curriculum, Graduate Council, and others. There is more potential for partnerships and sharing this data as librarians interact with other groups such as the University Retention and Enrollment Management teams. Working on assessment at the institutional level facilitates collaboration among all assessment professionals.

Another benefit is that since we are already collecting and reporting the data there is no monetary cost and little time involved in this approach. The standardized data lends itself to longitudinal benchmarking to track improvements or deficiencies over time. Should the administrators choose to make comparisons with other institutions, either with regional centers of higher education or those seen as competitors, these data are also readily available. The Pittsburgh region is an area with a high concentration of academic intuitions. Using the ACRL and NCES statistics allows for comparisons with libraries at the University of Pittsburgh, Carnegie Mellon University, Point Park University, Chatham University, Carlow University, Robert Morris University, and LaRoche College, or even those institutions in bordering states of West Virginia, Ohio, and Maryland.

Standardized library data is easy to interpret and offers an alternative approach to the multi-faceted methods of qualitative assessment like designing tests and surveys and analyzing and interpreting those results. This formal comparison provides a context for substantiating service and staffing recommendations. Past LibQUAL+ results indicated that the academic programs having the most interaction with the library experienced the highest levels of satisfaction. Now we can supplement those findings by showing administrators that we teach more instruction sessions than our peers, while also sparking discussion about library collection and salary expenditures that do not rank as favorably. Although some might argue that libraries should not focus on input and output data, the emphasis is on hard facts that speak clearly to busy administrators versus qualitative data that can be difficult to interpret.

Problems
Analyzing and presenting standardized data across peer libraries only provides a piece of the puzzle. This type of quantitative comparison does not account for high impact services provided by librarians, such as teaching information literacy courses for specific majors, leading freshman learning communities, providing expert consultation for tenure and promotion, and consulting on systematic reviews. Nor can generalized comparisons be made about other institutions offering similar services. Challenges still exist to demonstrate the value of these types of services to administrators in other, more engaging ways.

Future
The LAC plans to present this data annually along with explanatory text, discussion points, and strategic emphases that match university administrators’ priorities. As is the case among peer institutions and higher education in general, Duquesne is experiencing budgeting challenges. These challenges are exacerbated because Duquesne’s budget is highly tuition dependent, and the region is experiencing slow population growth. Salary and staffing decisions during these times are crucial.

What are the other implications of this data? For example, should we target against peers at the top of these categories? Are these goals reasonable and within the library’s control, and will there be support for these priorities? Several top administrators are relatively new to Duquesne. A new provost and vice president for management and business have been appointed in just the past two years. These issues are timely as the university finalizes a new strategic plan for 2015–2020.
Recommendations
Libraries need to present university administrators with statistics that are related to strategic initiatives, mission, and goals. Furthermore, libraries need to examine how they can tailor derived statistics to show how well the library is meeting those institutional priorities. In the long term, providing this kind of data can bring about change. In the short term, administrators often have discretionary funds to support strategic initiatives or special projects, and highlighting a need can position the library to benefit. Additionally, libraries need to consistently present the data in a format that is not only visually appealing and familiar, but also lends itself to making straightforward comparisons.

Conclusion
Unquestionably, libraries need to continuously demonstrate their value. Along with other academic units, we are consistently asked to provide evidence of learning and our impact on student success. Used discriminately, otherwise mundane reports, such as data taken from the ACRL and NCES, can persuade administrators to recognize that the library is an essential indicator of a university’s strength. Reframing existing library data within a larger context provides a sustainable, effective, and easy way for inviting university administrators to the table and ultimately emphasizes the scope of the research library’s role in the institution’s overall assessment.

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Notes
Roving: Aimless or Purposeful?

Monena Hall
Virginia Tech, USA

Introduction
Many academic libraries are implementing, or have implemented, roving reference. For this paper, roving reference is any point of need assistance to library users, both in the library and across campus. Roving services at Virginia Tech Libraries were first discussed with the development of the learning commons and assessment librarian position in early 2012. One of the job responsibilities for this position was to create and manage roving services for Virginia Tech Libraries. During the summer and fall of 2013, Virginia Tech Libraries began planning the implementation of roving services in its main library. Job descriptions, training, procedures, and data collection tools were developed. Beginning during the fall 2013 semester, the library ran a pilot program using undergraduates to provide roving services during extended evening and weekend hours throughout the week.

Need
During the needs assessment phase, we determined that not only did we want to provide services at the point of need, but we also wanted to get a better understanding of how patrons are using library spaces, how they feel about changes in the library, and what they would like to see changed moving forward. Using various research on roving services, plus the learning space toolkit, we developed a set of tools that allow the student workers to report findings during their shifts.1

What Do the Rovers Do?
Peer roving assistants provide a variety of services within the library. Their main duty (50 percent of their time) is to walk the library and assist library users with issues such as way finding, answering printer/photocopy questions, and locating books in the stacks. The rovers report that during some periods of the semester, they spend as much as two-thirds of their shift at the printers helping students print assignments and resumes. Twenty-five percent of their time is spent observing particular spaces within the library. They spend approximately 10 percent of their time taking photos to document interesting happenings, student use of library whiteboards, and interesting books in the stacks, while also conducting quick informal interviews with library users. For the ubiquitous “other duties as assigned,” they are responsible for checking the printers for paper, refilling office supplies at stations through the library, and reporting messes to our housekeeping services.

Rovers work either three or four hour shifts, depending on the day and time. Most student rovers typically work less than 12 hours a week, with four of them working approximately six hours per week. The schedule for roving is Monday–Wednesday, 10–4 and 6–10, Thursday, 10–4 and 6–9, Friday 10–4 (no evening shift), and Sunday 12–4 and 6–10. We do not schedule rovers on Saturday. This schedule equals approximately 53 hours per week of observation and assistance.

Roving Toolbox
A Gmail account was created specifically for this program and all information gathered by the rovers is kept in folders on Google Drive. There are separate folders for photos of spaces, book spines, observation data, interview transcripts, and more.

We created a set of tools for collecting observational and interview data. The observation form was based on the template created by NCSU available at http://learningspacetoolkit.org.2 In creating our observation form, we looked at the Learning Space Toolkit, Needs Assessment sections on users, activities, furniture, and technology. In order to make the data gathering more seamless, we created a Google Form for the rovers to fill out during the observation period. This observation form dumps straight into a Google Spreadsheet for easy comparison and collection. Fields such as number of seats occupied, number of people studying in groups and individually, number of people using power, and number of people using...
personal computers are all required fields. Other fields such as number of people in study rooms, number of people eating, sleeping, etc. are not required. This variation in required versus not required fields allows for variations in space design and setup by permitting rovers to skip a field that does not apply to a specific space.

Rovers also conduct interviews with students who are using library spaces. Rovers are trained to only request interviews from those users who look like they are easily approachable. Again, some questions are mandatory for all interviewees while others are not. Mandatory questions include year, major, why they study in the library, and how much time they spend in the library. Other alternate questions include thoughts on furniture, new coffee shop, and preference for studying in groups or alone.

Roving students also help our patrons at the point of need in the library. Training concerning databases, book stacks, and microfilm/fiche is provided before their first solo shift. Similarly, they are trained to provide basic research assistance, as well as the protocol for referring our patrons to subject specialist librarians. Every time a Rover helps a library patron, we ask them to fill out the Service Point Survey, which is an internally created database that is based on the ARL Annual Survey needs. Rovers are required to keep track of all reference and informational/directional transactions. Not only does this data feed directly into the ARL Annual Survey, but it also helps us understand what types of questions are being asked while out among our patrons. Further, we can use this data to gain a better understanding of wayfinding and signage needs around the library.

Whiteboard Initiative
At several points over the course of a semester—sometimes as often as once a week, sometimes every few weeks—we post informal questions on a large easel whiteboard near the main entrance. These questions vary greatly in topic and include questions such as: What’s the best movie you’ve seen lately? Why do you study in the library? Do you prefer a quiet or loud floor? Print or e-book? The whiteboards provide a safe and completely anonymous way to garner feedback from, and engage in conversation with, our users. Not all of the responses we receive are serious or accurate, but they are typically amusing and provide additional insight into our user groups, while providing a means for developing a sense of community within the library.

Observation
Rovers spent approximately a quarter of each shift conducting observations. At the beginning of the semester, we set the observation schedule and put it on the group Google Calendar. We observe one location in the library each week during the semester for the first 15 minutes of each hour. This results in 33 unique observation periods each week.

Because we count the number of seats occupied at each observation, it is important to know the number of chairs in an area. Further, most library furniture moves; sometimes it seems like it does this all-by-itself! In order to add a bit of accuracy to our data collection, the roving team counts the chairs in the observation area twice per week on an alternating schedule: Sunday afternoon and Wednesday night, followed the next week by Sunday evening and Wednesday morning. The same two student rovers are responsible for counting the chairs, but this pattern alternates the responsibilities.

During the observation we count a number of things including the number of chairs occupied both at the beginning and the end of the period, the number of groups broken down by size of the groups (2–3, 3–6, over 6 people), what our users are doing (telephone, socializing, eating, sleeping), the number of devices they have, and how many of those devices are being charged. Additionally, the observation form asks the Rovers for other comments about the observation period, allowing the student workers to reflect on what they saw in the observation area. Some of the rovers are loquacious and provide tons of information, while others tend to be more terse and provide the bare minimum. As the team leader, I have assured the team that this information is helpful, but not required, and not to concern themselves with writing too much or too little.

Photos
During each shift, rovers are asked to photo document spaces within the building. We ask that they take photos of whatever strikes them as interesting, with the understanding that if they photograph people they must either get the subject’s permission, or the subject must
not be identifiable. Rovers often take pictures of interesting furniture arrangements, interesting whiteboard work (drawings, equations, study guides), or book spines that catch the eye. The primary purpose is that the subject or area be interesting to the photographer. If we catch something particularly interesting, that photo is then shared with library administration. The associate dean for learning and outreach occasionally reviews the photos and picks out ones that he finds interesting or helpful for illustrating use of space to university administrators, campus partners, and architects.

**Project Complications and Solutions**

Over the eight months that this project has been in place, the observation form and the interview form have changed. This is necessitated by the changing landscape of a library under constant, if small, renovations. Because we are in a period of rapid transition and change, books are being shifted, stacks are being moved and removed, and furniture is being replaced and moved. One Friday afternoon our facilities crew removed 75 chairs and their tables; this affected data collection drastically for that week!

Students have lives outside of this job? In fact, my crews of six are involved in a variety of academic and extracurricular activities. Some are in student government, tutors, teaching assistants, club presidents, aspiring medical students, and playwrights. Above all, they are undergraduate students with the primary goal of doing well in their education so they can then move on to a successful career or graduate program.

To ensure that their work complements their education and professional development, I treat them as the autonomous adults that they are. On one hand, this is my project, and I need them to help me execute it. On the other hand, I share with them the understanding that they are the ones who actually do the work, and therefore, the workflows and processes need to work best for them. I strive to be flexible in giving them ultimate control over how they achieve our goals. As a result, I find that they take their role very seriously.

To help ensure that they have time to brainstorm about the project and fix problems or misunderstandings with the forms, we have regular team meetings. I originally set these at once per month, but at the rovers’ request, we have moved these meetings to every two weeks. As the roving students understand the project and the impact it is having on the library and library services, they make recommendations for their workflows and help clarify what data to collect. Regular meetings allow us all space to make these necessary changes.

**Findings**

Data collected through this project provided some interesting insights into library use. Using Tableau Public, the free version of a data visualization tool, a roving student created several graphics and charts that illustrate library usage.

Chart 1: This chart shows the percentage of occupancy by observation area. Second floor occupancy is shown by the orange, Kelly green, and red, representing a full third of all occupancy for the first year of observation. Likewise, occupancy for the 4th floor is shown in avocado green, red, and violet, representing an additional third of total building occupancy. The remaining third of the graph shown below is building occupancy of the 1st, 3rd, and 5th floors of the library combined. While this certainly did not surprise anyone, we were excited to see evidence of what many of us had suspected.
Chart 2: This next chart shows occupancy based on areas of observation and day of the week. The data suggests that for most floors of the building, occupancy is highest on Wednesdays.

Chart 3: Power usage is one of the biggest issues for older facilities. When we ask our students what we could do to improve library spaces they always want power or outlets. In the chart below, each floor has its own color, and is broken down by observation area.
Chart 4: This is the most interesting chart. During the observation period, roving students conduct a quick count of the number of people working alone and in groups, with groups counted as pairs, groups of 3–6, and groups larger than 6. Pairs and groups must be obviously working actively together rather than simply occupying the same table. This graph shows that regardless of where our users are studying in the library, they are doing it primarily alone. While this does not surprise us on the 1st, 3rd, and 5th floor (these are the “quiet” floors), we were surprised to find that this is also true of the 2nd and 4th floors.

Conclusion
Data collected through this project has informed furniture purchased, signage, and some services. This data has also given us concrete examples of use, rather than our assumptions of use. It has proven some of our assumptions of library use, and disproven others. Through the observations and the interviews, it has given our primary user group a platform, both collective and individual, from which they can be heard.

Using undergraduates to take an active part in qualitative library assessment and services benefits everyone. It is empowering for student employees to see that not only is their work valuable, but that they have the power to manage the project, and that library administration looks to the data the
roving students collect for decision making. Those conducting the research are not just employees, but also the project’s target audience (undergraduate students) allowing the library their perspective on service changes. Library users are often more willing to talk to their peers about issues they see. Our users see a group of friendly faces that can help them find what they are looking for and that can help advocate for change through the interviews and observations. We look forward to more years, more data, and more learning directly from our users.

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Notes


What Do University Rankings Tell Us About Perceptions of Library Value?

Brian Jackson
Mount Royal University, Canada

Abstract
Despite their weaknesses, university rankings have significant influence on student and faculty recruitment and on the missions and goals of higher education institutions. With influence comes the ability to define which university functions are most important to overall quality. While libraries have established numerous methods of demonstrating their value to parent institutions, rankers have guided perceptions in the broader community of the factors that are most valuable to higher education stakeholders.

This study examines national ranking systems across four countries to determine if and how libraries are positioned as a factor in university quality. Results suggest that libraries are not a significant factor in most university rankings. Of those that do include libraries, expenditures and student surveys are most frequently used as indicators of library quality. Libraries can respond to under- or misrepresentation in rankings by demonstrating the impact of the library on other indicators used in rankings or by offering more meaningful measures of library quality.

Background
Academic libraries have long been considered central to the mission of the university. In the past, it was an accepted truism that quality universities had quality libraries with large collections. While the LIS field has moved beyond simple holdings inputs in describing the contribution of the library to the university, it is not entirely clear if that message has resounded beyond libraries. One way of determining current perceptions of the library’s contribution to the university is to look at the role that the library plays in evaluations of university quality. As widely read measures of universities, rankings provide an interesting view of perceptions of the importance of libraries to university quality.

Few college and university ranking agencies are explicit about the purposes of their activities, although some provide indications about their intended audiences. Both the US News & World Report and the Guardian claim to assist families and potential students with enrollment decisions. The Guardian Guide makes the additional claim that it is “watched keenly” by graduate employers and university administrators. The Times Higher Education World University Rankings is broad in its reach, aiming at “students, academics, university leaders, industry, and governments.” Presumably, the purposes of the rankings, aside from selling print publications and boosting web traffic, are to provide a broad range of stakeholders with the information needed to make decisions related to registration and recruitment, university policy, accreditation, or funding in higher education.

There is evidence that rankings do indeed influence university stakeholders. Multiple studies have demonstrated that the decisions made by students to attend a particular institution can be influenced by rankings. One Canadian survey, for example, found that the Maclean’s and Globe and Mail rankings were very important factors in the enrollment decisions of 19% and 13% of undergraduate students respectively. Other studies have demonstrated some degree of influence by rankings on faculty recruitment, institutional planning with respect to research, curriculum, organizational, and marketing structures, and on government funding of postsecondary institutions.

The choice and weighting of variables included in university rankings tells a story about perceptions of the value of universities and university services. Rankings have target audiences, and each publication attempts to frame university quality from the perspective of its audience. The Globe & Mail’s Canadian University Report and the US News & World Report’s Best Colleges are aimed at potential students and so define university quality by factors assumed to be most valuable to incoming undergraduate students such as acceptance and
retention rates, campus services, recreation, and class sizes, among other factors. Other ranking schemes aimed at government, university administration, and funding bodies may attribute more weight to variables related to research and international cooperation. The persistence of rankings suggests that there is some agreement among stakeholders that these measures are useful in making decisions about one or more aspects of university quality.

The far-reaching impacts of rankings have been characterized repeatedly as problematic in higher education literature for the overlapping reasons of methodological shortcomings in ranking schemes and undue influence of rankings on the higher education system. Criticisms surrounding methodology have pointed to a heavy dependence on quantitative measures, overreliance on research outputs, a lack of scientific basis for the weighting of variables, an inability to measure teaching quality well, and the use of reputational components that tend to reinforce the status quo. If the methodologies driving rankings are so flawed, their impact on higher education is very troubling. Reliance on rankings to define the quality of a university has the potential to narrow the diverse missions of educational institutions and to create a hierarchy of goals in which research outputs and institutional prestige are at the top. It creates a reactive environment in which those involved in academic activities have stopped defining their own value in order to focus on excellence in areas deemed valuable by the rankers.

Methods
This study focused on national rankings, as none of the major global ranking systems include indicators that measure library quality. In order to determine how national rankings situate libraries within institutional rank, the author conducted a scan of fourteen media-based and standalone ranking publications: eight from the United States, three from the United Kingdom, two from Canada, and one from Australia. This convenience sample of ranking systems was chosen based on circulation statistics of parent publications or prominence in web-based search results. While this method of sampling is not rigorous, it is difficult to determine with certainty which rankings have the greatest influence on stakeholders, and the sample used is sufficient for some conclusions to be drawn.

The methodology of each ranking system was analyzed for indicators that measure library services both directly and indirectly. Direct measurement includes library indicators that are reported or weighed independently, as opposed to indirect measures, which include library data only as part of a broader indicator (e.g., spending on academic services).

Findings
All direct and indirect measures of library services were based on one of two methods of data collection—either quantitative input data or questionnaires (see Appendix). Inputs used to measure library quality included expenditures on library services, as an absolute value or a percentage of institutional expenditure, collections budgets, total print holdings, and print holdings per student. In all instances in which questionnaires were used, current students comprised the intended sample population.

In only three instances were library indicators used as direct measures of university quality. Maclean’s Guide to Canadian Universities uses quantitative data on library budgets as a percentage of institutional expenditure, percentage of library expenditures dedicated to acquisitions, per student holdings, and total holdings (only for universities defined by the publication as medical/doctoral).
These factors are weighed separately, comprising in total 12% to 15% of the overall rank, depending on the year of publication and category of university. While Maclean’s uses more library data in its ranking methodology than any other publication, it should be noted that electronic resources are not included in the holdings data and some of the data used by Maclean’s is out of date.21

The remaining two publications that use direct measurements of libraries are the Globe and Mail’s Canadian University Report and the Princeton Review. The Globe and Mail conducts a regular survey of undergraduate students, which includes multiple questions about library services. The specific questions used to grade libraries vary by year, having been based on one question regarding overall satisfaction with the library in some years and the mean scores on multiple questions regarding availability of resources, space, and hours in other years. Rather than ranking services, the Canadian University Report provides universities with a grade for each indicator as well as one for overall student satisfaction. There is no indication of how each variable is weighted in determining overall satisfaction. The Princeton Review also uses a survey methodology to measure library quality. Only one question about library services is included, “How do you rate your school’s library facilities?” the results of which are available as standalone information but do not contribute to an overall rank.

Five additional ranking systems use indirect measures of library services in determining university quality. Institutional spending on libraries is captured within other indicators by the US News & World Report’s Best Colleges (total spending on support services), the Guardian’s League Tables (expenditures per student), the Sunday Times University Guide (facilities and services spending), and the Complete University Guide in the UK (academic services expenses). In addition to facilities and services expenditures, the Sunday Times uses the results of the National Student Survey (NSS) in its methodology, which includes one question regarding overall satisfaction with library services. Interestingly, both the Complete University Guide and the Guardian also use NSS data, but neither includes results related to libraries. One additional ranking scheme, used by the website College Prowler in the US, includes one question that asks students to rate their campus library as part of a quality measure of university facilities.

Discussion

If perceptions of the value of the library’s contribution to the university are measured by the presence of library indicators in university rankings, these results paint a bleak picture. Only eight of the fourteen national rankings systems in this study include any measures related to libraries. Of those eight, three publish data specific to libraries and only one ascribes weight to the library’s impact on the quality of the university. These data, combined with the absence of library indicators in global rankings, suggest that most of those who rank universities do not consider library quality to be a significant factor in stakeholder decisions regarding university choice, higher education policy, funding, or recruitment for employment.

Of the rankings that do include libraries, the dominant measure of library quality is institutional expenditures on libraries. None of the rankings’ methodological descriptions provide an empirical basis for the use of this indicator. It may seem intuitive that libraries that receive greater funding are better able to provide levels of service desired by stakeholders, but there is evidence that this may not always be the case. It has been demonstrated that scores on the LibQUAL+ service quality survey are not related to either expenditures22 or to the ARL Index,23 which is largely based on financial inputs, nor do library expenditures consistently correlate with output measures such as information literacy instruction, circulation, and reference transactions.24

Student satisfaction is the second most common library indicator in university rankings. One might argue that the degree to which current students are satisfied with the library is a valid performance measure that provides useful information to stakeholders, potential students in particular. But in nearly all of the rankings in this study that use a questionnaire, student satisfaction is determined by one question. This approach involves no regard for fluctuations that inevitably occur between the quality of a library’s services in different areas of operations. For the individual incoming student, overall student satisfaction with the library provides little information with which she or he can predict the quality of her or his experience—the
way in which each student interacts with the library differs. For other stakeholders, organizations that fund faculty research for example, student satisfaction may not provide any useful information at all.

These arguments are not to imply that expenditures and student satisfaction are not important measures of library quality. Libraries themselves use these indicators regularly. But whereas libraries typically incorporate these data into broader evaluations of the student and faculty experience, rankings dilute these measures to such an extent that they provide no real indication of library or university quality.

In the face of under or misrepresentation of libraries in universities rankings, libraries must grapple with the same dilemmas that have faced university administration. On the one hand, no institution or department wants to be excluded from an increasingly influential system. To accept exclusion from rankings may be perceived as acceptance that library quality is not important to stakeholders. On the other hand, to participate in a flawed system that measures quality based on inputs may undermine efforts of libraries to communicate their real impact on university outcomes. The debate may be academic anyway, as inclusion in rankings is not typically a matter of choice for universities. In Canada, as an illustration, a number of universities chose not to submit data for the Maclean’s Guide to Canadian Universities, citing methodological problems with the ranking system as the reason. Regardless, Maclean’s has continued to publish its rankings, obtaining data from other sources.

That does not mean that libraries have no recourse. One avenue that has already been explored is to link library services with non-library indicators used in rankings. As previously mentioned, this has been done with regard to student retention, reputation, research outputs, and overall rankings. In the library assessment literature, much effort has already been made to demonstrate the library’s contribution to university outcomes and outputs, some of which are used in rankings. In addition to the above variables, it would not be a stretch to show library impact specific to ranked indicators such as faculty research grants, graduation rates, and graduate employment rates.

LIS professionals might also make a greater effort to contribute their expertise to rankings by offering meaningful and practical alternative indicators. Library associations have a long history of collecting data on and even ranking member libraries. The ARL Investment Index (US) and the Library Index BIX (Germany) are two well-known library rankings, but associations such as ACRL (US), SCONAL (UK), CAUL (Australia), and CARL (Canada) also collect statistics on member libraries that are much more comprehensive than those used in university rankings. In most cases, the data used in rankings might be enhanced with additional indicators that are already available—library staff to student ratios, number of seats, physical and virtual library visits, interlibrary loans, operational hours, and contact hours between professional staff and students and faculty, among others. Like expenditures and overall student satisfaction, none of these performance measures, taken alone, provide an accurate picture of library quality suitable for consumers of rankings. But if library associations are willing to provide this information for ranking purposes and ranking agencies recognize that these data are relevant to stakeholder decision making, taken together these measures would paint a more comprehensive picture of library quality.

Conclusion
Libraries have made great strides in conveying their value to the missions of their parent institutions. New ways of demonstrating the impact of the library on students and faculty are continuously being explored. University rankings, though, are one area in which the value of the library is largely ignored. Given the breadth of readership and reporting associated with rankings, and the importance ascribed to them by administrators, the absence of library related indicators may undermine the efforts that have been made to demonstrate that a good library helps make a good university. Rather than dismiss rankings as flawed, libraries would benefit from further exploration of their impact on current rankings and by communicating to those who design ranking systems how library value can best be measured.

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Notes
1. Robert Morse and Sam Flanigan, “How U.S. News Calculated the 2014 Best Colleges


9. Ibid., 102.


### Appendix

**Direct and Indirect Measures of Libraries in University Rankings**

<table>
<thead>
<tr>
<th>Ranking/Survey</th>
<th>Country</th>
<th>Direct Library Measures</th>
<th>Indirect Library Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maclean’s Guide to Canadian Universities</td>
<td>Canada</td>
<td>New acquisitions, institutional spending on libraries, holdings per student, total holdings</td>
<td></td>
</tr>
<tr>
<td>Globe &amp; Mail Canadian University Report</td>
<td>Canada</td>
<td>Survey - Student satisfaction with library services</td>
<td></td>
</tr>
<tr>
<td>Princeton Review Best College Rankings</td>
<td>US</td>
<td>Survey - Best college library</td>
<td></td>
</tr>
<tr>
<td>Complete University Guide</td>
<td>UK</td>
<td>Academic services spending</td>
<td>Expayment per student</td>
</tr>
<tr>
<td>Guardian League Table</td>
<td>UK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College Prowler</td>
<td>US</td>
<td></td>
<td>Survey - Facilities</td>
</tr>
<tr>
<td>US News &amp; World Report Best College Rankings</td>
<td>US</td>
<td></td>
<td>Total spending on support services</td>
</tr>
<tr>
<td>The Sunday Times University Guide</td>
<td>UK</td>
<td></td>
<td>Survey - Student satisfaction; Services and facilities spending</td>
</tr>
<tr>
<td>Good Universities Guide</td>
<td>Australia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumers Digest Top Values for Colleges and Universities</td>
<td>US</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newsweek/The Daily Beast College Rankings</td>
<td>US</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washington Monthly College Guide</td>
<td>US</td>
<td></td>
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</tr>
<tr>
<td>Forbes America’s Top Colleges</td>
<td>US</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global Language Monitor TrendTopper MediaBuzz College Guide</td>
<td>US</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Using Library and University Statistics to Create an Effective Funding Narrative

Brian Keith
University of Florida, USA

Background
The University of Florida (UF) is a major, public, comprehensive, land-grant, research university and among the nation’s most academically diverse public universities. It is one of only 17 public, land-grant universities that belong to the Association of American Universities, and is one of the largest universities in the nation, with more than 50,000 students. In 2014, with the support of state lawmakers and the UF Trustees, UF launched UF Rising—a five-year initiative to elevate the university to be among the nation’s top public universities. Projected expenditures of $950 million will be aimed at hiring new midcareer and eminent professors, adding new endowed professorships, and upgrading and adding facilities.

The UF libraries form the largest information resource system in the state, consisting of seven libraries; six are in the system known as the George A. Smathers Libraries. These six libraries include the Health Science Center Libraries (HSCL). The University of Florida Legal Information Center reports through the College of Law. The Smathers Libraries are a member of the Association of Research Libraries (ARL) and other distinguished associations.

In 2011, UF adopted Responsibility Centered Management (RCM) as the campus budgeting and fiscal management model. The fundamental premise of RCM is to shift from centralized budgeting to a system with responsibility placed on the colleges for managing and expanding their revenue. Under RCM, the university’s colleges became Responsibility Centers and the libraries became one of the numerous Support Units (non-revenue generating units primarily providing services to Responsibility Centers). Most university revenues are allocated to Responsibility Centers, which must fund the direct expenses for their colleges, such as salaries for college staff, and pay taxes for the services provided to the college by campus entities like the libraries, physical plant, academic advising, campus human resources, and various other offices and officials. The colleges must balance the revenues generated (which may increase or decrease due to factors within and beyond their control) with these direct and indirect expenses and at least break even every year. Through a University RCM Budget Review Committee (largely comprised of college budget officers appointed by the respective college deans), the colleges make recommendations to the university administration about Support Center funding based on the services and resources, new or continuing, they deem worthwhile. RCM ideally permits decision making where outcomes of strategic value to the university are given greater weight and the achievement of the university’s goals supersedes any unit’s individual self-interest; however, any funding allocated to a Support Unit, like the libraries, results in less discretionary funding for the Responsibility Center.

RCM was implemented at UF at a time of severe budget reductions, including steep cuts in state appropriations, which are a critical funding source for the colleges and the primary source of funding for the Smathers Libraries. The UF libraries entered RCM chronically underfunded and facing escalating materials costs. Since July 1, 2009, the Smathers Libraries have experienced $2.4 million in recurring funding cuts and $700,000 in one-time cuts. Materials costs have increased by an average of 5% per year, and this has resulted in a purchasing capacity gap of $2.6 million from the funding level in FY 2008.

RCM, combined with decreased university appropriations and lost purchasing power for library materials has increased pressure (internally and externally) to assess library funding and expenditures. In this environment, the libraries needed to develop effective methods for analyzing and communicating its budget circumstances and for determining what appropriate funding levels
should be in order to adequately serve UF’s faculty, students, and researchers.

Findings
The Smathers Libraries have engaged in repeated and varied analyses of how the resources of the libraries and the demands of UF compare to peer institutions. Data from the National Center for Education Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS) has been used as measures of university characteristics that correlate with demand for library resources and services (e.g., number of faculty) and university resources (e.g., revenue). ARL Statistics have been used for measures of library resources including funding, materials, and staffing.

This analysis has consistently showed, across methodologies, that the scope of the university population and programs at UF are significantly above average for peer institutions, which suggests comparably higher demand. Incongruously, the fiscal and human resources of the UF libraries are significantly below the average for library systems at peer institutions. Said differently, there is a considerable and statistically significant gap between the scale of UF demand, and the resources of the library system.

Linear Regression Analysis
Linear regression analysis is a statistical technique used to model the relationship between two variables: independent variables (e.g., university budget) and dependent or response variables (e.g., library budget). Linear regression is used to estimate the causal effect of the independent variables on the dependent variable. In instances where this effect exists the model may serve to predict one variable if the other variable is known.

The statistical significance of the relationship between the independent variable and dependent variable, that is, the degree of confidence in how the true relationship is close to the estimated statistical relationship is a key determination in interpreting regression analysis.\(^1\) A measure of this statistical significance is \(r\)-squared or the coefficient of determination. The \(r\)-squared measure indicates the proportion of the change in one variable that is predictable from another. Said differently, \(r\)-squared represents the percent of variation in a variable that can be explained by the relationship between the two. \(r\)-squared ranges from zero to 1.0 and the larger the number the greater the statistical significance of the estimated relationship.

Peers
Comparisons required that the libraries identify peer groups. Three groups of AAU public universities that comprise relevant peer groups for UF were used initially. Group A is comprised of six comparable universities from the top 11 U.S. News & World Report public universities in 2013. These represent aspirational peers as UF was ranked 15\(^{th}\) and UF aspires to join the ranks of the top public universities. Group B represents a broader population: ten of the top 25 U.S. News & World Report public universities, all of which are comprehensive universities with law schools and two or more health colleges. Group C results from a list of peers provided by the university that had reportedly been used for previous peer comparisons. This last group of peers was comprised of distinguished public universities, but the methodology used to identify the specific schools was not available.

Relationships between Library and University Expenditures
The relationship between library expenditures and university expenditures were compared for the University of Florida and the three peer groups for UF. Linear regression analysis shows a positive and predictive relationship between university funding, as reflected in total university expenditures from all sources of funds, and library funding, as reflected in total library expenditures at these top institutions. This is not the case at UF, where the library expenditures fall well below the best fit line for all peer groups and the positive relationship is muted.
Chart 1

2008-2012 Peer Averages and UF Actual
Total Library Expenditures v. Total University Expenditures

The r-squared values reported in Table 1 indicate the proportion of the change in library expenditures that is predictable by university expenditures. The statistical significance of the estimated relationship for Group A and Group B is high and reflects a significant relationship. There is no significant relationship at the University of Florida between university expenditures, which have increased over time, and library expenditures.

Table 1

<table>
<thead>
<tr>
<th>Group A</th>
<th>Group B</th>
<th>Group C</th>
<th>UF Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>R² = 0.8637</td>
<td>R² = 0.6398</td>
<td>R² = 0.445</td>
<td>R² = 0.0258</td>
</tr>
</tbody>
</table>

Relationships between Library Expenditures and University Income

The relationship between total library expenditures and the university revenue generated from tuition and appropriations also was analyzed for the University of Florida and Group A (six comparable universities from the top 11 U.S. News & World Report public universities) using linear regression—see Chart 2. Linear regression analysis shows there exists a recurring, positive and predictive relationship between university funding, as reflected in revenue from tuition and appropriations, and library funding, as reflected in total library expenditures. This is not the case at UF, where the library expenditures fall well below the best-fit line for Group A for each year analyzed.
UF, and other public universities in Florida, receive relatively low state appropriations and tuition. In fact, the state appropriations and tuition are nearly the lowest of any state. The relationships reflected in Chart 2 are important in that they scale the library expenditures, a reflection of library funding, to the tuition and appropriations funding actually received by the parent institutions. Accordingly, UF income from these sources may be lower than ideal, but the library funding is even lower than would be predicted by the relationship between these variables at peer institutions.

**Predicting UF Library Expenditures**

The model identified by the linear regression analysis of university revenue from tuition and appropriation at peer universities (independent variable) and total library expenditures at those institutions (dependent variable) for each year can be expressed in a regression line with a formula of \( Y = a + bX \). In this formula:

- \( Y \) = the dependent variable
- \( X \) = the independent variable
- \( b \) = the slope of the regression line
- \( a \) = the intercept point of the regression line and the y axis

The regression line formula is used in each of the best-fit lines shown in Charts 1 and 2.

Importantly, the regression line formula allows for the calculation of the predicted value for \( Y \) (library expenditures) if \( X \) (university income from tuition and appropriations) is known. Table 2, reflects the result of this calculation for each year from 2008 to 2012: UF Library Predicted Expenditures based on UF Tuition and Appropriations. Also presented are the UF Actual Library Expenditures and the difference between these figures and the predicted value.
As Chart 2 depicted, the relationship between university income from appropriations and tuition and library expenditures is strong and positive at peer institutions, but not at UF. Based on the relationship between these variables at peer institutions, the annual expenditures of the UF libraries fall between $14 and $15 million below the level that would be predicted (using the regression line formulas) given the amount of tuition and appropriation revenue generated by the university.

Summary
Linear regression analysis provides a statistically valid method for assessing the funding for individual libraries as compared to peers. In the case of UF, this analysis proves that library funding is atypical compared to relevant peer institutions. The results of the analysis are not only statistically significant but are easily understandable, which is equally important. As a result of the analyses and the communication of these findings, the financial situation of the George A. Smathers Libraries has been acknowledged by key decision makers in the RCM system at UF.

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Notes
Driving Partnerships for Assessment and Engagement

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Abstract
The Clark Memorial Library at Shawnee State University, an open access public institution in southern Ohio, established a partnership with the Office of Institutional Effectiveness to develop an integrative approach to library assessment. Blending library data with institutional data presented both parties with a unique perspective of the student population and the ways library use can influence student success, particularly among the at-risk population. Outcomes-based assessment was incorporated by considering the impact of library materials use on graduation rates. This collaborative approach establishes the library as an essential assessment partner to the university in efforts to improve student retention and graduation rates in a climate of government directives constrained by economic scarcity.

Overview
University libraries, while building a stronger presence in assessment measures,¹ have not yet perfected the process of integrating library outcomes into the corresponding institutional culture. Building a stronger relationship between the academic library and the university as a whole requires effort, dedication and communication in order to appropriately document how libraries contribute to student learning outcomes and student success. Shawnee State University’s Clark Memorial Library embarked on a project to combine library and institutional data to communicate how the library underwrites the university’s mission and strategic goals of improving student retention and success.²

Shawnee State University is a regional open access institution serving students primarily from the Southern Ohio Appalachian area. The university serves a significant percentage of first-generation college students as well as many students who enter college with a status of academically underprepared, and subsequently require developmental coursework in mathematics and/or English and reading.³ These factors, combined with the state of Ohio’s move to a performance-based funding model,⁴ provides impetus for the university, and the library, to be more intentional about linking organizational activities to student centered outcomes.

Blending the Data
Given these growing pressures, the university library and the Office of Institutional Effectiveness (OIE) developed a partnership to combine data demonstrating the library’s contribution to university goals. Such initiatives to break down institutional data silos⁵ enable the library to move toward meaningful outcomes-based assessment. The library maintains standard usage statistics such as door count, space usage counts, and checkout data. While useful, these measures remain along the lines of traditional input-output analysis. As the data warehouse for the university, OIE aggregates demographic, enrollment, and performance-based student data. Blending these two data silos enables the library to understand the demographics of the user and non-user populations and to gain an understanding of how library use impacts student outcomes through course grades, grade point average (GPA), retention, and graduation rates. This is a simplified approach corresponding with more complex studies of library use and its impact on student retention and graduation rates.⁶ In turn, enhancing institutional data with library data allows the university to gain a stronger understanding of the impact and value of the library to institutional goals.

In initial analysis, the library was able to offer materials checkout data as an indication of library use. Library use in all calculations in this particular study was defined as checking out one or more materials from the library in a student’s academic career. Using student ID number as a common variable, the library team was able to blend this data with an extensive dataset from OIE. This dataset included demographic information, GPA, and graduation data for each semester.
beginning with academic year (AY) 2007–2008 to
AY 2012–2013. This was a valuable time period,
because it marked the institution’s transition from
quarters to semesters in 2007. This time frame
also allowed for calculations mimicking the IPEDS
cohort for graduation rate calculation and aligned
with parameters set by the Chancellor’s Plan.
Using Tableau software an analysis of the user
and non-user population characteristics as well as
outcomes-based studies were possible. Loading
data into Tableau via Excel, Access, or a text file
allows quick, visual analysis of large datasets. Such
efficient analysis allows the library to respond
quickly to changing user needs or administrative
data requests. Such analysis provided the valuable
observations presented below.

Understanding Users
The extensive demographic information
provided by OIE was invaluable for gaining an
understanding of the library user and non-user
population, including the ability to view the
proportion of campus residents, traditional versus
nontraditional, declared major, and college-
readiness, among many other demographics.
Most striking was the analysis of first-generation
college student use. The institutional population is
typically comprised of about 73% first-generation
students. In the analysis of first-generation library
use, the library user population is comprised of
81% first-generation students. This may suggest
that first-generation students are more often using
the library to check out materials, which could
include print resources, laptops, and course reserve
materials. The understanding that the library may
be an important component of the first-generation
college experience proved useful in library planning
for outreach initiatives in the subsequent academic
year. For example, the library has used this
information to develop an updated and focused
approach to the Personal Librarian program,
bringing more focused attention to the complex
needs of underprepared students and processes for
interacting with these users across campus, and at
the point of need.

In addition to first-generation status, the library
team examined the use behaviors of college-ready
students versus non-college-ready students. Using
ACT subject benchmarks for college-readiness, it
was determined that college-ready students use
the library at higher percentages (49%) than those
students who are not college-ready (41%). This
is another important observation for strategic
planning in outreach and instruction efforts.

Outcomes-Based Assessment
Though it was valuable to understand the makeup
of the library user and non-user population,
outcomes-based assessment was the most pressing
goal. We were able to emulate previous studies
that correlate library checkout data with GPA
information. In our analysis, increased checkouts
related with increased GPA. This observation
also proved valuable in outreach efforts.

The most exciting measure was the mimicking of
the IPEDS graduation rate calculation, breaking
the population into user and non-user groups.
The IPEDS cohorts comprised for graduation
rate calculations include all full-time, first-time,
bachelor degree seeking students who enter in
the summer or fall of a particular academic year.
Graduation rates are calculated at 150% of the time
it would take to earn a degree—in this case, six
years. Defining our groups by these parameters
and separating into library user and non-user
characteristics allowed us to determine that those
students who check out materials graduate at more
than double the rate of non-users. Those who
check out materials graduate at a rate of 52%, while
those who do not check out materials graduate at a
rate of 22%. This also provided excellent outreach
and advocacy opportunities; communicating
this correlation can provide support for creating
a culture that encourages use of the library and
library materials.

Challenges
We faced several challenges in carrying out
this study. First, privacy concerns needed to be
addressed. We addressed these concerns by gaining
approval from our Institutional Review Board and
ensuring that no identifying characteristics other
than student ID number were used. Additionally,
results are only reported in the aggregate.

Second, while studies like this one are helpful,
we recognize that we are only considering
correlation and not causation. It is hoped that in
future iterations of the study, we will be able to
incorporate additional variables to broaden our
definition of library use and gain a more robust
analysis of the impact of use on student outcomes.

Finally, and most importantly, it was a valuable
discovery that the library was not collecting data in the same time series as the institution. The institution can essentially provide a data snapshot for each semester. The value of this is that they can drill down to a student’s particular behavior in any given semester. Library data however, accumulated over time, making such granular analysis impossible. At the start, then, we had to rely on aggregate and average observations. Immediately following this discovery, the library was able to institute a practice of capturing a snapshot of the accumulated data at the close of each semester so that future analysis can be more targeted to behaviors per semester and related outcomes.

Data-Driven Decision Making
To support data-driven decision making on campus, the library has been using the data gathered to reinforce changes in the library’s activities and priorities. For example, a reorganization of staff and librarian positions has enabled the library to place personnel in areas of need, including staffing for streamlined desk services and personalized outreach efforts for underprepared and first-generation students. Library presentations at new student orientation events have brought parents into the conversation, sharing the correlations between higher GPAs and library usage. Library outreach initiatives have taken center stage, providing support and marketing for students to associate the library with a place they want to be, and a place where they can get needed tools and support for their academic work.

In an effort to further understand the ways users interact with the virtual areas of the library, infrastructure to link remote accesses of electronic resources, as well as website analytics, has been explored in order to gather aggregate data on uses that occur outside the physical library building. Additionally, the library has begun collecting patron ID numbers in order to collect information that can link library usage, such as reference questions, research consultations, instruction sessions, library events, etc., to student success initiatives.

Conclusion
Building a strong suite of library partnerships and services on a regional campus can be challenging, but creating a data-driven environment to provide measurable evidence of the importance of the library is one pathway to success. Combining the data analysis, communication, and use of the findings to support planning initiatives provided an optimal approach for developing a foundation for future library planning.

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Thank You
A special thanks to Kimberly Patton, Institutional Research Analyst in the Office of Institutional Effectiveness, and Vickie Crawford, Senior Analyst/Programmer of University Information Services, for their help in procuring and preparing data for this analysis.

Notes


5. Margie Jantti and Brian Cox, “Measuring the Value of Library Resources and Student
Academic Performance through Relational Datasets,” *Evidence Based Library and Information Practice*, no. 2 (2013): 163.


The Stat Solicitor: Proving Academic Value through Statistics

Sarah H. Northam, Gail Johnston, Megan Beard, Scott Lancaster, and John Atabaev
Texas A&M University-Commerce, USA

Abstract
In 2011, after using statistics gathered with DeskStats to successfully argue for the creation of a new model of reference service, we developed a plan to expand and sustain the use of DeskStats to meet a broader range of needs within the library. Data gathered allowed Research and Instruction to convert what, in the past, had been anecdotal evidence into quantifiable results that supported real changes and improvements within the department, while also providing evidence of assessment from the library for the upcoming Southern Association of College and Schools reaccreditation. As each project was completed, data was examined to formulate a new focus for future data collection, which has led to a sustainable process of assessment and improvement. The results had a multilevel impact. On an individual level, statistics demonstrated increased efforts by RIS and identified areas for improvement. On a managerial level, statistics were used to create and support proposals for changes and improvements, and on an administrative level, the statistics were used in the decision-making and funding process.

Introduction
In 2011 Texas A&M University-Commerce (A&M-Commerce) Libraries conducted a study using the statistical tool, DeskStats. The data collected was used to gain measureable evidence that reference librarians were answering a majority of customer service questions at the reference desk instead of research questions. After two semesters, statistical trends supported the theory and the information was used to create a new model of reference service. Our question then became, what else can we do with DeskStats?

A&M-Commerce was scheduled for a reaccreditation assessment by the Southern Association of Colleges and Schools (SACS) regional accrediting body, so the library needed a way to provide evidence of assessment. The library assessment method prior to fall 2012 was to take a one-week sampling of reference questions and instruction attendance in order to determine statistical information for annual reporting to the Association of College and Research Libraries (ACRL) and National Center for Education Statistics (NCES).

We developed a plan to expand and sustain the use of DeskStats to meet a broader range of needs within the library. Instead of just tracking the types of questions, we began to also track activities such as instruction/research appointments with faculty, attendance at our subject liaisons departmental meetings, attendance at campus events, and scheduled appointments with faculty and student clientele being carried out by the department.

Research Agenda
In a workshop about the academic value of the library presented at the 2012 Association of Research Libraries Assessment Conference in Charlottesville, Virginia, Megan Oakleaf stated that it is important to know what you want to determine and what you hope to achieve before you develop an assessment tool. Having had a successful implementation of one assessment plan using DeskStats in FY2012, we chose to repurpose DeskStats for a second assessment.

When we initially started using the Altarama Information Systems product DeskStats to analyze our customer service and reference transactions, we were concerned with an appropriate division of labor to improve customer service. We wanted to know what types of questions were being asked, when, and where questions were being asked, and who was answering them. We used that data to create a new reference model as justification for hiring a computer technology person to handle the questions originating from the computer lab and a research associate for basic-level research.
assistance; we also cross-trained customer service staff to answer simple reference questions.

These changes allowed the reference librarians more time to connect with both faculty and students and focus on more in-depth research consultations. It also freed up more time to take care of other duties such as collection development, materials purchasing, tutorial creation, and remote reference services.

In the spring of 2013, the reference department presented a strategic plan to library administration to rebrand the department and to personalize our services. We proposed a name change from “Reference Services” to “Research and Instruction Services” to more accurately reflect what services our department offers. DeskStats had shown us that we were offering more research-oriented services than traditional ready reference assistance. A review of library literature highlighted the trend across the country of libraries moving away from having a “reference” department. We also changed the librarian’s job titles from “reference librarian” to “research and instruction librarian.”

The strategic plan laid out specific initiatives which included increased faculty, student, and instruction services. These initiatives included the goals of increasing faculty face-to-face contact by five percent over the previous fiscal year; organizing a monthly faculty speaker series to recognize faculty research; the creation of nine video tutorials; targeted advertising to faculty, graduate, international, and distance students; and increasing the number of library instructions that the department taught by ten per year. These initiatives were to be implemented over a two-year period between 2013 and 2015. The first phase of the plan (2013–2014) focused on increasing research and instruction contact with our library user groups.

We used DeskStats to track our contact statistics. While completing our initial study in FY2011, the library focused on the types of questions asked and created a matrix of the types of questions that were received (see Figure 1). One of the first tasks for the department was to analyze current tracking categories in DeskStats and to determine if any changes were needed, such as renaming, adding, or removing categories. The department sought to assess the type of transactions that were occurring, examining factors such as whether it was a quick reference transaction or a more lengthy research appointment. A decision was made to gather demographic data if it was readily available, and to record how the question was being received: electronically (e-mail, chat, text), by phone, or in person. The next step was to modify the DeskStats matrix to evaluate the new data that would be collected. The department specifically wanted to examine the number of students and faculty that were assisted one-on-one and through a group/classroom setting (Figures 2 and 3).

DeskStats was also used by other library departments such as Special Collections, Government Documents, and the Curriculum Materials Center to help assess the types of questions that they were receiving, how long they spent assisting patrons, and the type of patron (Figure 4).

Significance and Application

With a SACS reaccreditation coming up in the spring of 2014, the academic departments and support units on campus were scrambling for assessment tools to demonstrate their impact on student learning and retention. The library decided to focus on five areas for our assessment: Collections, Instruction, Facilities, Services, and Outreach. DeskStats was chosen as the tool to measure results. Due to changes made to the matrix it was easy to use DeskStats as a measure for the assessment plans for Instruction and Outreach, incorporating information already being collected by various library departments. This put the library ahead of several other departments on campus who had to create tools from scratch. The Instruction Assessment tool created for the SACS study utilized DeskStats by looking at the number of instructions taught and the number of students in attendance, and a secondary assessment used the number of faculty members who sought library research assistance. The Outreach Assessment tool utilized statistics collected that were tied to library related events and event attendance (Figure 5).

From a managerial standpoint, DeskStats has been invaluable to the head of Research and Instruction Services. Data has been utilized to show an increase year-to-year in student attendance at library instructions, the number of library instructions conducted, contact with faculty, and utilization of the library’s Ask a Librarian
electronic services program (Table 1). All of these were heavily marketed by the department to try and increase awareness of the services to the university community. Analyzed data from DeskStats was used as support for the development of RIS’s strategic plan, a reorganization of the RIS librarian’s duties, and a remodel of the RIS suite to make it more inviting to the university community. Analyzed data from DeskStats was used as support for the development of RIS’s strategic plan, a reorganization of the RIS librarian’s duties, and a remodel of the RIS suite to make it more inviting to the university community. Proposals were written using the data collected in DeskStats to request the LibAnswers platform, the software product Camtasia, and video conferencing equipment. The data from DeskStats is analyzed monthly to look for new trends or potential needs of the university community. Utilization of DeskStats has allowed the department to move away from sampling as a tool for assessment for yearly reporting to library administration, ACRL, and NCES. The library’s sampling method was to choose one week each year to track library reference and customer services transactions including classroom library instruction. This number was then multiplied by 52 to provide the annual statistics. Because sampling can over-inflate or under-inflate yearly statistics based on the week chosen, the use of DeskStats made the information provided more reliable.

Library administration also found an important use for DeskStats to determine appropriate staffing. DeskStats proved that our staffing model was inefficient and outdated. The original purpose of reference librarians, to guide library users to print reference resources, became obsolete with the emergence of online resources. With DeskStats, we found that most of the questions answered at the reference desk were customer service and directional questions. Not only was this an inefficient use of professional expertise, it was an inefficient use of salary dollars. It was determined that the higher salaries of degreed librarians were better spent on tasks that required the specialized training, such as collection development, in-depth research consultations, and faculty liaison work.

To remedy the inefficiencies, we implemented a new staffing model. We created two new positions that were paid at a lower pay rate; a library assistant position to monitor the computer lab and answer questions regarding computers and printing, and the position of reference associate to answer simple reference questions. More complicated research questions are referred to reference librarians, who maintain on-call hours. The change in staffing has made it possible for professional librarians to engage in professional activities such as faculty outreach, collection development, instruction planning, and creating online tutorials and instructional videos. It has also afforded librarians more time to engage in service and scholarship.

Continued assessment using DeskStats shows that the change in staffing is more efficient both fiscally and professionally.

Providing Academic Value
In her editorial “Do the Right (Write) Thing: Engaging in Academic Library Value Research” Megan Oakleaf writes that if you can provide “purposeful” evidence of your library’s impact, “…librarians can form a plan to engage in evidence collection, formative or summative assessment, and purposeful research to determine…value and impact...” By tracking statistical data in DeskStats and then aligning that data with library assessment strategies and departmental goals, our library has been able to provide hard evidence of the value of the various services that we are providing to our university and also indicate how those services are affected by different factors. This not only makes it much easier for RIS to request changes and needed materials but it also gives library administration statistical evidence when approaching university administration for additional funding or staffing.

Conclusion
This cycle of data collection is an easy assessment plan that can be recreated at almost any library. There are many different tools, both free and for purchase, available to libraries that can be used to track different types of data. DeskStats is just one of these tools; Google Forms is an example of another. For us, the decision to use DeskStats and to continue its use was based on the ease of use and its ability to support multiple users at several service points, a custom report feature, and the ability to customize and change as much as we needed. For anyone who wants to use data collection to demonstrate academic value, it is important to determine what it is you want to track and what you hope to accomplish by tracking it. For our library we first determined what it was we wanted to accomplish and then created a matrix in DeskStats to give us the evidence to support our desire for change. Then we used that evidence to demonstrate the impact of those changes.
Notes

References:


Oakleaf, M. “Library Value: Conceptualizing, Capturing, and Communicating Impact.”

Library Assessment Conference Workshop. Workshop conducted at the Omni Hotel, Charlottesville, Va. (October 2012).
## Figures and Tables

**Figure 1:** Screenshot of portion of DeskStats tracking sheet January 18, 2013.

<table>
<thead>
<tr>
<th>Reference Assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog - Keyword</td>
</tr>
<tr>
<td>Catalog - Subject</td>
</tr>
<tr>
<td>Catalog Advanced (view, score, audio, etc)</td>
</tr>
<tr>
<td>Catalog Lookup (Title, Course Reuse, Author)</td>
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<tr>
<td>Citation Question</td>
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<tr>
<td>Class Assignment Request</td>
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<tr>
<td>Community Legal/Gov Request</td>
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<td>Endnote Web</td>
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<tr>
<td>Government Documents</td>
</tr>
<tr>
<td>How do I renew items</td>
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<td>Social Work Legal/Gov Assistance</td>
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<td>Student - Other Legal/Gov Request</td>
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<td>Faculty Collaboration</td>
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<td>Faculty Conversation</td>
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<td>Faculty Email Contact</td>
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<td>Faculty Marketing</td>
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<td>Faculty Question (General) 1</td>
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<tr>
<td>Instruction Request Class 1</td>
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<tr>
<td>Office Visit</td>
</tr>
<tr>
<td>Research Question</td>
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<tr>
<td>Response to Faculty Email</td>
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Figure 4: Special Collections, Curriculum Materials Center, and Government Documents Data Collection

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<td>University Archives</td>
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<td>Digital Collections</td>
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<td>Online Archive</td>
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<td>County Records or Minute</td>
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<td>Student - Other Legal/On Request</td>
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<tr>
<td>Community Legal/On Request</td>
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</table>

Figure 5: SACS Instruction Assessment Plan Strategies

ASSESSMENTS OF STRATEGIES

- **DeskStats Demographic Data – Student Instruction (A)**
  - Standard of Success set at: 10 additional classes over the previous year, by tracking instructional information through DeskStats
  - Timeframe of Administration: Academic Year 2014
  - Data Disaggregation: Analyze DeskStats data, divide instructions by class level, student population, and class type

- **DeskStats Demographic Data – Faculty Instruction (B)**
  - Standard of Success (1) set at: 3 workshops carried out per long semester
  - Standard of Success (2) set at: Attendance of 15 faculty members over the semester for a total of 30 over the year
  - Timeframe of Administration: Spring 2014, by semester thereafter
  - Data Disaggregation: Analyze DeskStats data by faculty demographic (college, department, faculty rank)
Table 1: FY2013 compared to FY2014

*The Ask a Librarian program did not start until FY2013
What is the value of conducting library assessment if we do not communicate the results with stakeholders? From standardized annual statistical surveys and metrics, to qualitative data from interviews and focus groups, members of the library assessment community have collected an abundance of data. It often falls on the members of the library assessment community to analyze, visualize, and communicate the results and findings in order to demonstrate library impact and continue improving ourselves. However, library assessment methods and data are complex, which makes effective communication a difficult yet important task. While there is an increasing number of library science literature that focuses on how to conduct assessment projects and data analysis, guidance or best practices on effective communication using assessment data are rarely discussed. Figuring out how to communicate and present library assessment data has become a trial-and-error process that many assessment professionals have to endure.

When we communicate assessment results effectively, we should be able to get our points across and our ideas accepted by our colleagues and stakeholders; regardless of whether the results are presented in text, graphics, or what computer programs were used to produce the results. I will (1) address common problems that I observe with library assessment data and the ways we communicate results and (2) recommend talking points and strategies for effective communication.

Too Big
Libraries, like the Census Bureau and other organizations that maintain large data collections, often compile and summarize the data into data tables because it is a quick and affordable way of sharing data. Data collected about library usage such as reference transactions, circulation statistics, or electronic resource statistics (Figure 1) are often presented in this style. However, there are often too many data cells for the audience to read and comprehend.

![Figure 1 Electronic Resource Usage Report COUNTER Database Report](image)

Too Little
People often cite assessment results as quick facts in publications or promotional materials. A quick fact might look impressive (Figure 2) but gives the audience too little information to judge its value or to apply the information effectively.
Too Much Information
Because library assessment results can be massive and complex, many librarians try to create one presentation such as a single radar chart to summarize everything in the results (Figure 3). The intention here is that the audience would discover the layers of information through one chart. In reality, the amount of information packed in the chart and the use of multiple colors and circular shapes (as opposed to the rectangular bar charts) are more likely to confuse the audience than allow for meaningful interpretation and use.

Say What?
It might sound trivial, but deciding on whether results should be presented as text or graphics requires experience to know which approach is more effective. For instance, sometimes it is important to describe the results in words and tell a story. On the other hand, a simple data table will make a small dataset or a handful of statistics more readable and communicate more effectively than words or graphs.

Prettier Isn’t Better
Many desktop or web-based programs offer new and visually stunning ways to visualize data nowadays. While making the assessment results with new technologies might make it look prettier, it does not necessarily mean that the information is communicated better for the audience (Figure 4).
When communicating to an audience with assessment data, the first question we need to ask ourselves is, “What is the purpose?” What do we expect the audience to learn from this communication? A clear purpose should guide the selection of data and techniques to be used for communication.

I believe that instead of focusing on “how” to communicate assessment results, librarians need to put the primary focus on “what” to communicate to our audience; “what” is the story that we want to tell? Simply put, we need to focus our communication on needs, trends, impact, and valuable information.

Communicate NEEDS
Take the electronic database usage report shown in Figure 1 as an example. Such data contains many data cells, and most people do not know where to start reading it. In this case, a simple spreadsheet formatting such as highlighting the top 10% in red can really help audience to zoom in on the key data points (Figure 5). We can also visualize the same data using colors or sizes instead of just showing plain numbers. The font size of the words in Figure 6 (electronic databases) is weighted by usage (number of searches) so an audience can easily identify most-used databases.
Some datasets such as time series data are collected with a goal to track changes over time and to identify trends. In Figure 7, it shows that while both the library expenditures and the university expenditures have increased over the years, the percentage of university funds allocated to the library has been decreasing. However, it is hard to assess the trend and its scale by looking at the table. In this case, a simple area chart (Figure 8) presents the decreasing trend more clearly and effectively.
Communicate IMPACT

Although assessment data are often quantitative and measurable, sometimes the most interesting things about the data are not the measurements but the individuals or groups that we measure by (dimensions). Figure 9 shows the reference transaction statistics (measurement) one library unit conducted with foreign institutions (dimensions) over a period of time. By presenting the same data over a map online (Figure 10), it allows user to interact with the data and tells a much clearer story of our work with international scholars and the impact we make around the world.
Communicate VALUABLE INFORMATION

Many library assessment projects collect data to demonstrate “our value”: 13 million books, 4.6 million visitors, hundreds of public computers, etc. While these statistics might look impressive, they do not answer users’ typical day-to-day needs, such as “where can I find a computer to work on my paper?” Figure 11 shows real-time data about lab computer and technology availability, which is a different way to utilize the “usage” type of data by showing the resources that are “not used” and the interested users can utilize this information right away.
Through these examples I hope I have proven to you that communicating assessment results is about focusing “what” you are communicating instead of “how” and effective communication does not require high-end software or strong technical skills. Most of the examples shown in this section were created using typical spreadsheet software or free online services. To access the interactive versions and the raw data (when applicable) please visit http://go.library.illinois.edu/lac14.

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Assessing Information Literacy and Critical Thinking across the Curriculum
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California State University, Monterey Bay, USA

Abstract
California State University, Monterey Bay created a 5-year assessment cycle to measure student achievement on each of the five core competencies identified by the Western Association of Schools and Colleges (WASC): critical thinking, information literacy, quantitative reasoning, oral communication, and written communication. The authors coordinated a campus-wide assessment of information literacy, which was paired with critical thinking due to their similarities. To maximize campus buy-in, assessment coordinators convened interdisciplinary groups of interested faculty to develop campus-wide definitions, outcomes, and rubrics for information literacy and critical thinking. Using adapted versions of the VALUE rubrics, faculty scored approximately 200 pieces of student work from almost 50 courses. Scores show only moderate proficiency levels in information literacy and critical thinking demonstrated in student work. Interventions to improve teaching and learning will be planned and implemented by faculty, and student work will be subsequently reassessed. In addition to establishing a baseline measurement for longitudinal assessment, generating ideas and momentum to improve teaching and learning in these areas, and helping the university meet reaccreditation requirements, this assessment process helped to create a shared understanding of information literacy and critical thinking among faculty and momentum to improve teaching and learning in these areas.

Background
California State University, Monterey Bay (CSUMB) is a public, Hispanic-serving institution with an enrollment of approximately 5,600 students for the 2013–14 academic year. Although the campus has some master’s programs, students are predominantly undergraduates (96%), over half of whom are first-generation college students, and over 40% of whom are underrepresented minorities. In addition, approximately 30% of our first-year students require remediation in reading and writing skills.

Prior to 2012, the campus General Education (GE) curriculum model was structured around learning outcomes for our 13 university learning requirements. Campus-wide assessment of student work was done through faculty learning communities. Student learning within the majors was assessed as a component of the departments’ self-study reports prepared for their program reviews.

Development of the new assessment plan began in 2012 in tandem with the new GE model and was adopted in spring 2014. The Assessment
Committee, which includes faculty representation from each college and the library, created the plan and is in charge of coordinating campus assessment goals, processes, and timelines.

The three major components of the Campus Assessment Plan are: assessment of student learning in the majors through the Annual Program Review Portfolio and Program Improvement; assessment of the GE learning outcomes; and a five-year assessment cycle for the campus core academic competencies, including information literacy and critical thinking (Figure 1).

<table>
<thead>
<tr>
<th>Core Competency</th>
<th>Plan Process</th>
<th>Collect Student Work</th>
<th>Respond to Data</th>
<th>Implement Changes</th>
<th>Close Feedback Loop</th>
</tr>
</thead>
</table>

To date, we have completed the first two years of the assessment cycle for critical thinking and information literacy, including development of the process and collection and analysis of student work.

The results of our assessment will be disseminated by the Assessment Committee in fall 2014, and work will begin on planning and implementing the identified changes in response to the assessment results.

Campus-wide assessment of information literacy
Examples of campus-wide assessment of information literacy appear in the library literature, although not extensively. Rockman describes various institutional efforts to do curriculum-wide information literacy assessment, including early efforts of the California State University that included an ethnographic study of student research efforts and interviews with the faculty and students involved. Beile discusses the planning and implementation of the information fluency assessment plan at the University of Central Florida, as well as the purposes to which program assessment results can be used. In more recent efforts, Holliday et al. discuss the assessment effort at Utah State University to illustrate trends in students’ information literacy performance at different levels of their curriculum, while Gordon describes the use of a student survey at Arcadia University to assess student descriptions of research and meta-cognition of the research process.

Joint assessment of critical thinking and information literacy
The synergies and overlap between critical thinking and information literacy have been noted in the library literature. Thompson describes the efforts of librarians and English faculty at New Jersey...
Community colleges to create learning objectives that incorporate both information literacy and critical thinking, noting the alignment between the two. Detmering and Johnson describe how reaccreditation efforts at the University of Louisville led to a campus-wide focus on critical thinking. This focus inspired the library to create information literacy modules with an emphasis on critical thinking, prompting students to apply critical thinking skills to the evaluation of information. Sorey and DeMarte of Tidewater Community College describe an assessment effort similar to ours that assessed seven general education competencies with adapted VALUE rubrics, starting with written communication and information literacy.

Based on our reaccreditation timeline at CSUMB, the campus decided to combine the assessment of some of the core competencies in order to have results for all five competencies within a reduced time frame. The Western Association of Schools and Colleges (WASC) held a retreat on the assessment of critical thinking and information literacy that highlighted the synergies of these two competencies and inspired the CSUMB assessment coordinators to assess them jointly.

Using rubrics for information literacy assessment

The use of rubrics to assess student work for evidence of information literacy skills is widespread. Rubrics can be used to assess authentic student work, permitting measurement of the application of skills in a real-world setting. They are adaptable to different assignments and can reduce scoring subjectivity by providing clear guidelines for each level of proficiency. Megan Oakleaf, in her article on the methodological considerations for rubric use, gives a useful overview of some of the literature describing rubric use for information literacy assessment in higher education. She also notes that rubrics may contain design flaws that affect their validity and reliability. The development of the VALUE rubric for information literacy by the American Association of Colleges and Universities (AAC&U) elevated the status of information literacy to something deserving of campus-wide attention. It also provided campuses a tool, based on the ACRL standards, that had been tested for validity and reliability and was broad enough to encompass the wide range of proficiencies found among college students at all levels.

Oakleaf’s article on the RAILS project describes the cross-campus collaboration and partnerships that may result from rubric assessment. Participation in a campus-wide assessment of student work can be a valuable learning experience for faculty, which was one of the goals of our assessment at CSUMB. Oakleaf notes that “VALUE rubrics, adapted for analytical, campus-specific purposes, can spur instructional improvements, increase assessment activity, and improve collaborations among faculty, co-curricular professionals, and librarians.” The VALUE rubrics’ potential for conducting a valid, reliable assessment of authentic student work across the curriculum made it a good choice for our assessment.

Methodology

The campus assessment committee and coordinators felt strongly that this assessment should be a faculty-driven process. While the assessment would provide a baseline measurement of student skills and compliance with reaccreditation requirements, its primary goal was to improve teaching and learning. Because faculty are in the best position to make improvements to teaching and learning, it was essential that they drive the process.

In fall 2013, assessment coordinators facilitated two faculty learning co-operatives, one on information literacy and one on critical thinking. Faculty interested in these areas were recruited for participation and given a small stipend for their time, based on the faculty development model employed by the university’s Center for Teaching, Learning, and Assessment. These co-operatives were tasked with creating campus definitions of information literacy and critical thinking, determining learning outcomes, and adopting a rubric for assessment. The AAC&U’s VALUE rubrics were starting points as their validity and reliability have been established, and they are widely used in higher education. The critical thinking rubric was adopted as-is, and the information literacy rubric was slightly modified. At the end of the semester, participating faculty were asked to use what they had learned from their participation to rewrite one of their assignment prompts to more explicitly include information literacy or critical thinking skills.
Many of the faculty who participated in these co-operatives responded to our call for applications to become Faculty Assessment Scholars. Application criteria included an expressed interest in information literacy and/or critical thinking and the willingness to participate in a spring co-operative and summer assessment work. All faculty across campus were invited to apply, and we chose to accept all 16 applicants, with the hope that greater participation would have an increased campus impact. Modest stipends for faculty assessment scholars were funded by the Provost’s Office.

During the spring 2014 semester, assessment coordinators facilitated a faculty learning co-operative for the Faculty Assessment Scholars. The group convened eight times over the course of the semester, and each meeting was held twice so that all schedules could be accommodated. The scholars were oriented to the assessment plan and to the definitions, outcomes, and rubrics chosen the prior semester. We engaged in extensive and invigorating discussions about what we wanted to learn from the assessment and what that meant for designing the assessment process. A good deal of time was spent reading assignment prompts to determine the extent to which they required critical thinking or information literacy skills, and reading and scoring sample student work for rubric norming.

Part of our work was curriculum mapping, as we needed a guide to where in the curriculum information literacy and critical thinking were being addressed. As a university practicing outcomes-based education, we started with classes that included relevant outcomes. All of the sections of First Year Seminar, a required course for first-year students, include information literacy outcomes, and there are several General Education (GE) areas that include either information literacy or critical thinking outcomes. Most GE classes are at the 200 or 300 level. In their final year before graduation, students must produce a capstone paper or project, and while the requirements vary by department, many include critical thinking or information literacy. Based on our curriculum map, we hoped to include courses representing each level (100–400), each GE area, and a variety of departments. Additionally, as a benefit to the Faculty Assessment Scholars, we offered to include any of the classes they taught that semester, irrespective of whether they fell into one of the categories of interest. We randomly selected five samples of student work from each class, and our goal was to read about 200 pieces of student work, which was the amount we thought we could accomplish with the given time and funding.

In the end, while our sample met the desired size, it was comprised of those classes from the areas noted above whose instructors volunteered to submit student work. Because this assessment was a faculty-driven process, the incentives for participation we could offer were somewhat limited. We tried to sell instructors on the project by describing not only the potential benefits for the university, but also for themselves, including a letter of acknowledgement to be used in retention, tenure, and promotion files, confidential scores for the sample from their class, and individual feedback on their assignment. We also emphasized that the results would only be reported in ways that individual courses or faculty members would not be identifiable, and that the results would not be used for personnel decisions. In some cases, one of the assessment coordinators spoke individually with faculty members who voiced concerns about submitting their students’ work. There were no consequences for not participating, and we were asking faculty to take the time to send us their assignments and student work at the end of the semester, a time when students were turning in the papers that we hoped could be included in the assessment, but also a notoriously busy time for faculty. The courses that were included spanned course levels, GE areas, and departments, but, as a convenience sample, limit our ability to accurately generalize to the entire campus.

We were extremely lucky to have the support of the campus Center for Teaching, Learning, and Assessment in this endeavor, as they provided their time and expertise to assist with tasks such as redacting identifying information from student work, anonymizing courses, digitizing hard copies, and funding and customizing Taskstream, the assessment management system we used for this project. Taskstream facilitated our work by providing a portal for faculty assessment scholars to easily access the student work and to assign scores based on our rubric.

The 16 Faculty Assessment Scholars spent four six-hour days reading and scoring the student work that was collected. Each piece of work was read by two scholars, and the coordinators monitored
the scores for splits. Scores were recorded and monitored in Taskstream. When an assignment prompt did not ask the student to address one of the rubric criteria, the score was recorded as N/A rather than 0. The group spent 30 minutes each morning discussing the process, including technical considerations and our collective learning. At the end of each day, faculty completed a 5-minute written, critical incident questionnaire, reflecting on the high and low points of the day and on their learning. A more thorough written reflection was completed on the final day of assessment.

As the assessment scholars were reading and scoring student work, coordinators monitored the scores for inter-rater agreement between the two scholars reading each paper. When the difference in scores for a piece of student work was greater than one point for at least three of the ten criteria, we brought the two scorers together for a re-norming consultation. These conversations resulted in a consensus on scores that did not diverge by more than one point. Unfortunately, the new consensus scores overwrote the original scores, preventing us from getting an accurate picture of inter-rater reliability. Our estimate is that re-norming conversations were only necessary for about 10% of the readings. Those Faculty Assessment Scholars who participated in re-norming consultations noted in their reflections that they were valuable and enhanced their understanding of the rubrics.

Results
The results of our assessment are presented in Figure 2. The levels represent courses at the 100 (level 1) through 400 (level 4) levels; rubric criteria are indicated along the x-axis, including five critical thinking criteria (C1–C5) and five information literacy criteria (IL1–IL5). The trend that appears in the results is that students are improving in their mastery of each area as they progress from 100 to 400-level classes. The improvements that they are making, however, are not nearly as great as we would hope. Students in 100-level classes are averaging rubric scores of 1.0–1.5, which is the range expected by AAC&U for first-year students. The gains made from the 100-level to the 200 and 300-level classes are mostly less than or equal to 0.5, and while there is a somewhat larger increase in 400-level scores, students are still graduating with average scores between 2.0 and 2.5, considerably below the graduation proficiency level of 4.0.
The criteria with the lowest average scores are Critical Thinking 3, “influence of context and assumptions”, and Information Literacy 3, “evaluate information and its sources critically.” While instruction librarians are aware of the challenges students encounter with evaluating information and may not be surprised by this low score, it should be noted that this is the criterion that we changed most significantly from the VALUE rubric. We were using a version of the Information Literacy VALUE Rubric prior to its July 2013 update, and in this version the standards for this criterion were identical to those for the Critical Thinking VALUE Rubric criterion “influence of context and assumptions.” In an effort to avoid redundancy, we modified the standards for that criterion to better reflect our interpretation of the skills required to evaluate information and its sources critically. The language we used was borrowed from rubrics available from other institutions of higher education, which may or may not have been tested for validity or reliability. Thus, the low scores for that criterion may have been influenced by the scoring instrument. The Information Literacy VALUE Rubric has since been updated.

How well the scores generated by this assessment reflect the actual abilities of our students is an important question. Participating faculty contributed student work from assignments that they considered to require some degree of critical thinking and/or information literacy. The assignments varied significantly in how closely they aligned with the critical thinking and information literacy rubrics, and in many cases, some of the skills measured by the rubrics were only implicitly required by the assignment. Had the assignments been designed to align with the rubrics or more explicit in their requirements for students to demonstrate certain skills, our results may have looked different.

An important outcome of our work was faculty development. Having daily discussions and written reflections during our assessment period allowed us some insight into what the Faculty Assessment Scholars learned from the process. Many of them made changes to their courses in spring 2014 based on their participation in the faculty learning co-operative. Learning how other faculty were addressing critical thinking and information literacy in their classes and discussing best practices for assignment prompts provoked scholars to make adjustments to their classes, and
some mentioned bringing back lessons learned to their departments. Faculty mentioned learning about the interconnectedness of critical thinking and information literacy, and the need to explicitly address them in their classes. Some also noted the importance of carefully crafting assignment prompts and the potential of sharing rubrics with their students. Overall, faculty reported being energized by their participation in the assessment, reinforcing our decision to make this a faculty-driven process.

**Conclusions and next steps**

Acknowledging the limitations of this study to reflect the true abilities of our students, we take the results of this assessment as an indication that we have room for improvement in the teaching and learning of critical thinking and information literacy on our campus. The nature of these improvements will be determined by the group of faculty (including Faculty Assessment Scholars and other interested faculty) who will convene in fall 2014 for a “closing the loop” faculty learning co-operative. While it would be premature to anticipate the results of that co-operative, some of the previous discussions by Faculty Assessment Scholars indicate an interest in exploring the qualities of an assignment prompt that elicit the best work from students. There may also be interest in creating a campus-wide understanding of these competencies and promoting a common language to describe them. Such efforts would facilitate the scaffolding of information literacy and critical thinking throughout the curriculum and help students recognize their application of similar skills across disciplinary contexts. Regardless of the form our interventions take, their effectiveness will be assessed in a few years, according to the campus’ five-year assessment cycle.

Beyond the lessons learned by our institution that will influence our future practice, there are two takeaway messages that may be applicable to a broader audience. The first is that there are advantages to assessing critical thinking and information literacy together. There are many synergies between the two competencies, and we found that most assignments that addressed one also addressed the other. Combining the two allowed us to gather a larger group of faculty than might have been possible otherwise. This was particularly beneficial for information literacy, as this competency gained exposure from the larger group of faculty whose initial interest was primarily in critical thinking. Some of those faculty are now “converts” to information literacy, especially given its close relationship to critical thinking.

The second lesson that may be of interest to other institutions is the value for faculty of being involved in the assessment process. Participating faculty felt energized by the process and have already begun to apply the lessons they learned to their teaching. While this group of 16 Faculty Assessment Scholars comprises a small percentage of faculty on campus, their advocacy for systematically addressing information literacy and critical thinking across the curriculum has great potential for effecting change.

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**Notes**


6. Robert Detmering and Anna Marie Johnson, “Focusing on the Thinking, Not the Tools: Incorporating Critical Thinking into an Information Literacy Module for


10. Ibid.

11. Ibid., 21.


Rubric Assessment of Information Literacy Skills (RAILS) was an IMLS-funded research project designed to investigate an analytic rubric approach to information literacy assessment in higher education. RAILS helped academic librarians and disciplinary faculty assess information literacy outcomes exhibited in “artifacts of student learning” including research papers, presentations, worksheets, portfolios, and reflective journals. Over a three-year period, RAILS yielded a suite of rubrics used by librarians and faculty to assess information literacy outcomes; a transferable model for analyzing rubric scores; training documents for librarians, faculty, and LIS students who seek to use rubrics for information literacy assessment; indicators of rater expertise in rubric scoring; and a clearinghouse for librarians and faculty assessment materials.

Although RAILS addressed practical assessment issues, it also explored the answers to several research questions:

- Can librarians and disciplinary faculty use IL rubrics to provide valid and reliable scores of student learning?
- What skills/characteristics do librarians and faculty need to produce valid and reliable scores using IL rubrics?
- What training materials do librarians and faculty need to acquire these skills/characteristics?
- How can rubric assessment be used to improve IL instruction and services and increase student learning of IL skills?

Initial answers to these research questions and others are shared in other RAILS publications, including the Library Assessment Conference 2014 paper entitled: “So What? The Results and Impact of a Decade of IMLS-Funded Information Literacy Assessments” co-authored with Carolyn Radcliff and Michele Van Hoeck.

In short, the RAILS project was designed around a multi-step process. First, learning outcomes were defined by AAC&U and ACRL and described using a rubric format. Next, librarians from nine institutions engaged in rigorous rubric training, tailored information literacy rubrics to their individual campus contexts, collected student learning artifacts for scoring, and collaborated with colleagues as raters. Then, raters were normed and then scored student artifacts; raters also completed surveys about their rubric scoring experience. Finally, rubric scores and rater surveys were subjected to statistical analysis, and tentative conclusions were drawn. In the end, RAILS rubrics described how well students in the study performed on a number of information literacy outcomes. More importantly, RAILS yielded transferable impacts based on RAILS interrater reliability data, data that revealed the degree to which librarians and faculty were able to build consensus on assessments of information literacy learning.

Viewed as a whole, RAILS data provided insight into best practices for developing information literacy rubrics, norming raters, overcoming assessment barriers, and selecting statistical analysis approaches. This paper describes ten “lessons learned” about writing rubrics—including “dos” and “don’ts”—and norming them with librarians and faculty. It describes statistics used to check the reliability of rubric assessments. Finally, it extrapolates general strengths...and major weaknesses...of rubrics as an information literacy teaching and learning assessment tool.

Take Away #1—Rubric advantages commonly cited in the literature are true. So are many disadvantages.

Much has been written about the advantages and disadvantages of using rubrics to assess student learning in general and information literacy in
At least three of these strengths were borne out by the RAILS project. For example:

• A key advantage of using rubrics for assessment is the ability to focus on authentic artifacts of student learning. Authentic artifacts like those used by RAILS participants (research papers, in-class worksheets, search histories, and more) allow assessors to analyze the products and/or process of student learning—products and processes that are integral to the learning process, embedded in the curriculum, and laden with as much intrinsic student motivation as is possible to capture in a higher education environment.

• A second important advantage of rubric use is the detailed, yet intuitive, level of results data they provide. Rubric assessment yields both quantitative and qualitative analysis of student learning when well-written, full-model rubrics are employed. RAILS assessors quickly and easily calculated the percentage of students that were described by each cell in a particular rubric and reported that number, along with the performance description articulated in the cell, to interested stakeholders.

• A third significant advantage of rubric assessment is the ability to incorporate, discuss, and normalize shared learning standards, outcomes, or values. RAILS assessors started with AAC&U and ACRL definitions of information literacy learning but tailored those conceptions to match campus-level and/or curriculum-level needs. Through a collaborative adaptation process, librarians and disciplinary faculty communicated their disparate and shared beliefs and gained a greater sense of ownership over both the concept of information literacy and their frameworks for assessing it.

Two weaknesses of rubric assessment were also substantiated by RAILS. For example:

• One major challenge inherent in rubric assessment is the difficulty of writing meaningful rubric content. Not surprisingly, poor rubric writing leads to poor assessment results. What may surprise some novice assessors, however, is just how difficult it is to write an effective rubric! RAILS rubrics were revised numerous times, often by multiple stakeholders. Despite assessors’ best efforts, some rubrics still included a variety of rubric content errors such as:
  - Criteria lists or performance descriptions that are too long.
  - Performance descriptions that are too vague.
  - Performance descriptions that are too specific.
  - Performance descriptions that lack consistent focus across performance levels.
  - Performance descriptions that lack differentiation across performance levels.
  - Performance descriptions that emphasize the quantity, rather than quality, of evidence of student learning.
  - Performance descriptions that are overly negative in tone at lower performance levels.

• A second significant disadvantage of rubric assessment is the amount of time required. RAILS assessors spent time developing rubrics, gathering artifacts of student learning, norming raters, scoring student artifacts, and analyzing resulting data. Indeed, assessors listed time as the primary challenge of rubric assessment.

Take Away #2—“I know an information literate student when I see one” does not equal “I can articulate and assess information literacy skills in artifacts of student work well enough that others will agree with me.”

While most RAILS assessors felt that they possessed a clear understanding of information literacy, both in its general definition and in its specific application to a particular domain or curriculum area, in fact, none could initially apply rubrics to student work consistently. In other words, assessors’ first attempts at scoring artifacts of student learning using rubrics showed almost no reliability. Because assessments that do not demonstrate reliability cannot be deemed valid, this is a substantial problem, and one that must be overcome if rubric assessments are to be used to make decisions impacting students’ academic careers. Fortunately, this problem can be addressed by norming.
Take Away #3—Norming is essential for establishing shared understanding of the rubric and achieving greater inter-rater reliability.

All RAILS assessors participated in a rigorous, multi-step norming process before recording their formal scores for student artifacts. That process is described in detail in another publication. The post-norming rubric scores are also available at the RAILS website for ten rubrics used at nine institutions. They can be viewed by student, by assessor, or by institution. While not every norming process resulted in strong inter-rater reliability results, all RAILS assessors deemed the process essential to secure “anything better than chance” inter-rater reliability results.

Take Away #4—Almost everyone likes norming, and many people are surprised by how much they like it.

All RAILS assessors responded to surveys designed to gather their feedback about the norming and scoring process. Surveys included both closed- and open-ended responses. One survey item asked respondents to describe their favorite aspect of RAILS; nearly all participants identified the norming process as the most enjoyable part of the process. Factors contributing to that enjoyment include: intellectual rigor, opportunity to discuss professionally significant concepts, and comradery with colleagues. Interestingly, many respondents noted that they were surprised by how much they liked the norming process; evidently, they had not expected to!

Take Away #5—If assessors want to make high stakes decisions about student lives, they must investigate—not assume—inter-rater reliability.

Most assessors agree that high stakes decisions should not be based on assessment data that is not demonstrably valid, and most assessors also know that a precursor to validity is reliability. That is, assessments that are not reliable (consistent scoring) cannot be deemed valid (accurate scoring). Therefore, the importance of determining the inter-rater reliability of a rubric used by multiple raters to assess student learning is clear. What is less clear is the appropriate measure for doing so.

Many rubric assessments found in educational literature use a Pearson correlation (rho) to measure inter-rater reliability. However, the Pearson statistic has a few flaws: it cannot calculate agreement among multiple raters. It can only calculate agreement between two raters and then average those agreements to estimate agreement among multiple raters. More importantly, Pearson focuses on the trend, not the strictness, of the assessor’s ratings. As a result, Pearson produces an analysis of agreement that many would consider “too easy.” For example, a rater who scored a student artifact across different dimensions as a 1, 2, and 3 and a rater who scored the same artifact as a 2, 3, and 4 would be judged by Pearson to have agreed perfectly. In this example, Pearson would return a result of perfect agreement where it does not actually exist.

A third statistic for measuring inter-rater reliability is Krippendorff’s alpha. Based on RAILS results, Krippendorff’s alpha appears to be the “Goldilocks” of inter-rater reliability measures—not too soft, not too hard, but rather “just right.” Unlike Pearson and Cohen, the Krippendorff statistic can calculate multiple raters in a single step. Unlike Cohen, Krippendorff’s alpha treats ordinal rubric data as ordinal data, not nominal data. Thus, the results of a Krippendorff inter-rater reliability measure appears to be the most accurate judge of agreement among multiple raters.

Because this is an evolving issue in rubric assessment, RAILS results are reported in all three ways: Pearson, Cohen, and Krippendorff. Even a
A cursory glance at the inter-rater reliability results gives assessors an idea of whether a particular rubric should be relied upon to make high stakes decisions about a student’s academic career.

Take Away #6 — Analytical rubrics appear to be more effective when assessing student artifacts of learning than holistic rubrics. Rubrics can be holistic or analytic. Holistic rubrics attempt to assess an artifact of student learning as a whole, without examining the parts of the whole in detail, and provide a single score or judgement of the entire artifact. Analytic rubrics, in contrast, divide a single artifact into component skills or parts that can be assessed separately and offer multiple scores or judgements for each of the artifact components or criteria.

While many available information literacy rubrics take a holistic approach (e.g., the AAC&U information literacy VALUE rubric), RAILS assessors found a granular, analytic approach to be more aligned with their needs. Most RAILS participants sought to use the results to not only assess current student learning levels but also to make improvements to future instruction. In order to determine what learning was lacking and where instruction needed to improve, a detailed and nuanced understanding of student skills was required—an understanding that analytic rubrics are better suited to provide.

Take Away #7 — Specific, precise, explicit, and detailed performance descriptions are necessary to achieve inter-rater reliability. The strength of analytic rubrics resides in its performance descriptions, and RAILS inter-rater reliability analysis indicated that the best results occurred when the performance descriptions were written in clear, precise, and distinctive language. Not only did the performance descriptions need to be well-written (e.g., focused on the same construct across all performance levels while simultaneously mutually exclusive so that a student’s performance could be assigned to only one level), they also must be concrete, explicit, and specific. Inclusion of “wiggle words” resulted in very poor inter-rater reliability results and therefore should be avoided. Examples of vague words and phrases to avoid include: few/some/many, as appropriate/needed, fully/partially/briefly, clearly/unclearly, sufficiently/insufficiently, thorough/superficial, adequate/inadequate, consistently/inconsistently, etc.

Take Away #8 — Raters appear to be more confident about their ratings when student artifacts are concrete, focused, and shorter in length. While rubrics can be used to determine the degree of learning revealed by any performance assessment, RAILS assessors preferred working with shorter and more concrete artifacts over longer and more abstract ones. At least in part due to the ergonomic issues of scoring multiple artifacts in one sitting (e.g., fatigue, eye strain, etc.), assessors reported feeling more confident when the artifacts they rated were focused on specific information literacy skills and required less scanning to locate evidence of the student skills being assessed. For example, assessors preferred scoring worksheets over research papers and search histories over annotated bibliographies. Of course, there may be cases in which a longer artifact is a more relevant and appropriate artifact for rubric assessment, but it should be noted that assessors may need additional time, guidance, or other supports to ensure a successful assessment.

Take Away #9 — There is no “magic bullet” rater. Despite a rigorous effort to determine characteristics that might predict which raters would be successful rubric assessors, RAILS data did not reveal concrete criteria that could be used to select raters for future rubric assessments. While previous research has employed a “gold standard” approach to seek out proficient raters, this approach was not feasible within the RAILS research design. However, an analysis of survey responses revealed that assessors who contributed to improved inter-rater reliability results articulated their “belief in” outcomes, their ability to value constructed consensus (or ability to “disagree and commit”), and a willingness to negotiate meaning across disciplines, develop shared vocabulary, etc. Until future research efforts can determine characteristics shared by successful rubric assessors, assessment planners may do well to seek out raters with these less-defined, but still discernable, dispositions.
Take Away #10—The process of composing rubrics and using them to assess student artifacts results in improvements in teaching, assessment, and collaboration—even when the student learning and inter-rater reliability results aren’t good!

Although some of the RAILS rubrics subjected to analysis did not produce assessment results that revealed high degrees of student performance and some failed to attain acceptable levels of inter-rater reliability, all ten RAILS rubrics resulted in assessors, both librarians and faculty, stating that the process of composing and assessing student work with rubrics yielded significant improvement in three areas: instruction, assessment, and collaboration. A full list of feedback in this area is available online. A few examples are shared below:

- “Participating in RAILS has fundamentally shaped the way my library conducts assessments of student learning. As a direct result of the RAILS experience, librarians at my institution now regularly collect student work from across the curriculum, collaboratively develop rubrics and assignments with faculty and others on campus (such as the Writing Center), use results to make continuous improvements to instruction and student learning, communicate the results of our assessments to a variety of campus stakeholders, and employ an assessment management system to gather and report assessment information. None of this would have been possible without the intensive training in rubric development, norming, and scoring provided by Professor Oakleaf. RAILS enabled librarians at my institution to implement a sustainable and meaningful student learning assessment program that will serve us well for many years to come.”

- “RAILS has had a positive impact on our information literacy assessment program in many ways. I am still collaborating with the nursing and pharmacy instructors from the RAILS pilot, and we have sustained the instructional changes we made as a result of rubric assessment. The nursing faculty in particular have embraced the culture of assessment and have integrated criterion from our original RAILS rubric into a larger rubric they use for a semester-long research assignment. We have also been using rubrics for our general education instruction sessions. The data we have collected has strengthened our assessment efforts. Now, in addition to librarian reflections and faculty survey feedback, we are able to provide data on student learning that takes place as a direct result of our instruction.”

- “Leading the Library’s participation through...the RAILS project was transformative for me. I came into the RAILS experience with years of information literacy instruction experience, but I was a novice in the area of information literacy instruction assessment. The experience was instructive in many ways, from leadership in consensus building to project management to rubric creation. I strengthened my knowledge of and comfort with assessment practices and clarified my understanding of how to use rubrics to assess student learning. As an increasingly confident assessment practitioner, I have recently taken on a leadership role as the Information Literacy Instruction Assessment Liaison. Currently, our information literacy assessment program targets students’ information literacy learning in first year seminar courses, but it will evolve into a full information literacy assessment program in the next few semesters. Most gratifying though, is the development of a community of reflective practice among my colleagues, which has surfaced as a natural secondary benefit to our collective rubric norming sessions. Our collaborative and ongoing learning approach about instruction and assessment has been a bonus for all of us. We now operate from the understanding that instruction and assessment are interrelated; and that increasing our assessment capacity boosts our teaching skills to the benefit of our students. I have begun to take on assessment responsibilities outside the library. For example, I was elected to the University Assessment Council a year ago. Our campus is evolving into a culture of assessment, and I value being able to both learn more about campus assessment practices and contribute to the conversation. Last winter, I was part of a team that helped to pilot a campus-wide assessment initiative called “Assessment Day,” a cross-disciplinary roundtable forum for faculty to examine, discuss and rate assessment plans and progress toward student learning outcomes. I believe that my RAILS assessment experience is steering me toward
more involvement in program planning. In the last couple years, I have been involved in local and regional conference planning. I have participated on two proposal review committees in an attempt to shape professional development offerings, partly to keep IL instruction and assessment as top priorities, but also to ensure that others have plenty of opportunities to engage in transformative professional development like I have.”

• “Participating in RAILS has enabled us to develop and pilot a process for collecting and assessing student work... As a result of RAILS, we have developed a student consent form for collecting and using student work. We were also able to work out how best to approach faculty to ask their permission to use class work and talk to their students, as well as how best to talk to students about why and how we would use their work. This was an unexpected opportunity to make more visible to students what is actually involved in doing research. In short, RAILS has enabled us to put systems and procedures in place that we will draw on for all subsequent assessment efforts!”

Conclusion
Over a three-year period, the RAILS project provided insights into student information literacy skills, the use of rubrics as assessment tools, librarians and faculty as raters of student artifacts, statistical inter-rater reliability measures, and the use of assessment data to “close the loop” and make significant improvements to instruction, assessment, and librarian-faculty collaborations. The results of this project are shared via a wide variety of publications and presentations (listed at http://railsontrack.info/publications.aspx). These research results and the aforementioned ten “take aways” can be applied to practice in libraries and on campuses nationwide.

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Endnotes


Exploring the Relationship between Undergraduate Students’ Use of Library Resources and Learning Outcomes

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Pontificia Universidad Católica de Chile, Chile

Purpose
The aim of this paper is to present preliminary results of one aspect of a project investigating associations between undergraduate students’ academic performance (grades) and use of library resources (physical and digital) at Pontificia Universidad Católica de Chile (UC). More and more, libraries compete for funding within their institutions and require demonstration of their value. Research on student use of library resources and its impact on their learning emerged as a form of responding to this demand. A report from the Association of College and Research Libraries states that data from institutions’ information systems have been poorly used by researchers. This has led to connect library research with the field of learning analytics, which is useful for detecting patterns from large sets of data, such as the ones created by students in their interaction with library services. Researchers who have followed Oakleaf’s suggestions have mostly found positive associations between library use and learning outcomes. We aim to replicate these investigations to answer the question of whether positive associations between library use (physical and digital) and student learning outcomes are similar at UC as reported in the literature.

Methodology
To answer the above mentioned question we developed a correlational study among the following variables: quantity of physical library resources loans, quantity of user access to library digital resources, and academic performance (grade obtained) of undergraduate students. In order to get values of the variables, we needed to access records of three university databases: integrated library loans database (ALEPH), electronic resources access database (EZproxy), and students’ academic records database (DARA).

Table 1 shows a general description of each database, specific data obtained, and number of records included in each database. All data corresponds to two consecutive semesters: second term of 2012 and the first term of 2013.

Table 1: Description of the databases used in this study

<table>
<thead>
<tr>
<th>Databases</th>
<th>Description</th>
<th>Data obtained</th>
<th>Number of records</th>
</tr>
</thead>
<tbody>
<tr>
<td>DARA</td>
<td>Students’ personal information and grades of student</td>
<td>Student demographics, carrer and courses grades</td>
<td>390,504</td>
</tr>
<tr>
<td>EZPROXY</td>
<td>Authenticated access to digital resources</td>
<td>Connection time, number of sessions, actions</td>
<td>10,683,534</td>
</tr>
<tr>
<td>ALEPH</td>
<td>Student loan records</td>
<td>Number of loans, types of loans, length</td>
<td>2,172,101</td>
</tr>
</tbody>
</table>

From each database we selected information related to our purposes. For example, from the DARA database we obtained the GPA of students for all courses they took. From EZproxy logs, we retrieved student connection time to electronic resources, number of sessions, and actions. From the ALEPH database we obtained information...
on the amount of loans, including printed and audiovisual materials and study rooms.

As shown in Table 2 we used OCDE classification areas to group the careers because we were interested in discovering usage patterns across disciplines. Therefore, we grouped careers in five areas as follows: Natural Sciences, Science and Technology, Health Sciences, Social Sciences, and Liberal Arts.

### Table 2: List of careers by OCDE areas

<table>
<thead>
<tr>
<th>NATURAL SCIENCES</th>
<th>SCIENCE AND TECHNOLOGY</th>
<th>HEALTH SCIENCES</th>
<th>SOCIAL SCIENCES</th>
<th>LIBERAL ARTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine Biology</td>
<td>Agriculture</td>
<td>Nursing</td>
<td>Anthropology</td>
<td>Drama</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>Civil Construction</td>
<td>Phono</td>
<td>Architecture</td>
<td>Art</td>
</tr>
<tr>
<td>Biological Science</td>
<td>Engineering</td>
<td>audiology</td>
<td>Political Science</td>
<td>Design</td>
</tr>
<tr>
<td>Astronomy</td>
<td></td>
<td>Kinesiology</td>
<td>Law</td>
<td>Aesthetics</td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td>Medicine</td>
<td>Geography</td>
<td>Philosophy</td>
</tr>
<tr>
<td>Mathematics</td>
<td></td>
<td>Nutrition</td>
<td>Business</td>
<td>History</td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td>Odontology</td>
<td>Administration</td>
<td>Literature</td>
</tr>
<tr>
<td>Chemistry &amp; Pharmaceutics</td>
<td></td>
<td></td>
<td>Teacher Education</td>
<td>Music</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Media Studies</td>
<td>Theology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Advertising</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Psychology</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Social Work– Sociology</td>
<td></td>
</tr>
</tbody>
</table>

Findings

As Table 3 indicates, 46.1% of students belong to social sciences careers, 25.9% belong to science and technology, 11.5% to liberal arts, 9.5% correspond to health sciences and 7.1% to natural sciences careers. In relation to usage of physical resources (printed material, study rooms and audiovisuals) we can see that natural sciences students (85.4%) and liberal arts students (83.5%) are the heaviest users. Regarding access to digital resources, the heaviest users are health sciences students (47.5%). Liberal arts (12.9%) and science and technology students (12.7%) have similar low behavior accessing digital resources.

We have to point out that the total number (20.6%) of students using digital resources includes only those who access them logging in from outside the university network.
Table 3: Percentage by area of undergraduate students using physical and digital library resources

<table>
<thead>
<tr>
<th>Physical Resources</th>
<th>Science and Technology</th>
<th>Liberal Arts</th>
<th>Health Sciences</th>
<th>Natural Sciences</th>
<th>Social Sciences</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(25.9%)</td>
<td>(11.5%)</td>
<td>(9.5%)</td>
<td>(7.1%)</td>
<td>(46.1%)</td>
<td></td>
</tr>
<tr>
<td>Physical Resources</td>
<td>68.6%&lt;sub&gt;b&lt;/sub&gt;</td>
<td>83.5%&lt;sub&gt;a&lt;/sub&gt;</td>
<td>72.5%&lt;sub&gt;c&lt;/sub&gt;</td>
<td>85.4%&lt;sub&gt;a&lt;/sub&gt;</td>
<td>70.4%&lt;sub&gt;c&lt;/sub&gt;</td>
<td>72.7%</td>
</tr>
<tr>
<td>Digital Resources</td>
<td>12.7%&lt;sub&gt;b&lt;/sub&gt;</td>
<td>12.9%&lt;sub&gt;b&lt;/sub&gt;</td>
<td>47.5%&lt;sub&gt;c&lt;/sub&gt;</td>
<td>29.8%&lt;sub&gt;a&lt;/sub&gt;</td>
<td>19.9%&lt;sub&gt;d&lt;/sub&gt;</td>
<td>20.6%</td>
</tr>
</tbody>
</table>

*: significant differences at the 0.05 level

The student percentage by area using printed and audiovisual material, and study rooms as shown in Table 4, shows that liberal arts students (92.2%) are the heaviest users of printed materials followed by natural sciences (78.4%) and social sciences (73.1%) students who have similar behaviors. Liberal arts students (34.8%) are the heaviest users for audiovisual material. Physical space (study rooms) use is mostly used by natural sciences (29.6%) and liberal arts (27.6%) students and less used by social sciences students (24.8%).

Table 4: Percentage by area of undergraduate students using printed and audiovisual material and physical space

<table>
<thead>
<tr>
<th>Physical Library Resources</th>
<th>Science and Technology</th>
<th>Liberal Arts</th>
<th>Health Sciences</th>
<th>Natural Sciences</th>
<th>Social Sciences</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(25.9%)</td>
<td>(11.5%)</td>
<td>(9.5%)</td>
<td>(7.1%)</td>
<td>(46.1%)</td>
<td></td>
</tr>
<tr>
<td>Print Material</td>
<td>68.3%</td>
<td>92.2%</td>
<td>61.9%</td>
<td>78.4%</td>
<td>73.1%</td>
<td>71.8%</td>
</tr>
<tr>
<td>Audiovisual Material</td>
<td>6.4%&lt;sub&gt;c&lt;/sub&gt;</td>
<td>34.8%&lt;sub&gt;d&lt;/sub&gt;</td>
<td>10.4%&lt;sub&gt;b&lt;/sub&gt;</td>
<td>12.1%&lt;sub&gt;a,b&lt;/sub&gt;</td>
<td>13.8%&lt;sub&gt;a&lt;/sub&gt;</td>
<td>13.2%</td>
</tr>
<tr>
<td>Physical Space</td>
<td>17.1%&lt;sub&gt;p&lt;/sub&gt;</td>
<td>27.6%&lt;sub&gt;a,c&lt;/sub&gt;</td>
<td>19.1%&lt;sub&gt;b&lt;/sub&gt;</td>
<td>29.6%&lt;sub&gt;a&lt;/sub&gt;</td>
<td>24.8%&lt;sub&gt;c&lt;/sub&gt;</td>
<td>23.0%</td>
</tr>
</tbody>
</table>

There are statistically significant differences in mean given the use of digital resources and physical space as shown in Table 5. Students who use digital resources have a higher grade point average than those who do not use them students who use physical space tend to have a lower grade point average than those who do not use it.
Table 5: Relationship between semester grade point average (GPA) and resource used

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>NOT USED</th>
<th></th>
<th>USED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
<td>SE</td>
</tr>
<tr>
<td>Digital Resources</td>
<td>5.09*</td>
<td>0.007</td>
<td>5.50*</td>
<td>0.010</td>
</tr>
<tr>
<td>Print Material</td>
<td>5.29</td>
<td>0.010</td>
<td>5.31</td>
<td>0.007</td>
</tr>
<tr>
<td>Audiovisual Material</td>
<td>5.29</td>
<td>0.006</td>
<td>5.31</td>
<td>0.012</td>
</tr>
<tr>
<td>Physical Space</td>
<td>5.32*</td>
<td>0.007</td>
<td>5.28*</td>
<td>0.010</td>
</tr>
</tbody>
</table>

As shown in Table 6 there are positive and significant but weak associations between semester grade point average and printed and audiovisual materials; a negative and significant but weak association between semester grade point average and physical space; and a positive, significant, and relatively high association between semester grade point average and digital resources.

Table 6: Relationship between semester grade point average (GPA) and resources used

<table>
<thead>
<tr>
<th>All Students</th>
<th>Print Material</th>
<th>Audiovisual Material</th>
<th>Physical Space</th>
<th>Digital Resources Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade Point Average</td>
<td>.061**</td>
<td>.022**</td>
<td>-.025**</td>
<td>.167**</td>
</tr>
<tr>
<td>Print Material</td>
<td>-</td>
<td>.224**</td>
<td>.123**</td>
<td>-.015**</td>
</tr>
<tr>
<td>Audiovisual Material</td>
<td>-</td>
<td>-</td>
<td>.042**</td>
<td>-.002</td>
</tr>
<tr>
<td>Physical Space</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.012*</td>
</tr>
</tbody>
</table>

**: correlation is significant at the 0.01 level (2-tailed).

As shown in Figure 1 there is a logarithmic correlation between semester grade point average (GPA) and digital resources activity. Each dot represents the semester grade point average for all students that have the same digital resource activity. R-squared = 0.68 means that 68% of the average grade can be explained by digital resources activity.
Figure 1: Scatterplot of relationship between semester grade point average (GPA) and digital resources activity

Figure 2 shows the linear progression logarithm of digital resource activity where each dot represents a student corresponding to one of the five different areas: i.e., health science students (yellow) are grouped toward higher grade point average and higher use of digital resources. Liberal arts students (black) are concentrated around lower digital resource activity.

Figure 2: Scatterplot of linear progression by digital resources activity on logarithmic scale
Finally, in Figure 3, GPA is shown as a dependent variable logarithm of digital resources activity, physical space, audiovisual material, and selection exam score (SAT equivalent) to control for initial academic performance. There are four models; each one adds a different variable. We started with the variable with the highest predictive power (digital resources activity). Models 3 and 4 include SAT (equivalent) as a variable with no impact. The variable with the highest explanation power for grade point average is digital resource activity (14.8%).

### Figure 3: GPA as a dependent variable

<table>
<thead>
<tr>
<th>Model 1</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(Digital Resources Activity)</td>
<td>0.223</td>
<td>0.017</td>
<td>0.152*</td>
</tr>
<tr>
<td>Model 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Digital Resources Activity)</td>
<td>0.220</td>
<td>0.017</td>
<td>0.151*</td>
</tr>
<tr>
<td>Physical resources</td>
<td>-0.007</td>
<td>0.002</td>
<td>-0.047*</td>
</tr>
<tr>
<td>Model 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Digital Resources Activity)</td>
<td>0.217</td>
<td>0.017</td>
<td>0.148*</td>
</tr>
<tr>
<td>Physical resources</td>
<td>-0.007</td>
<td>0.002</td>
<td>-0.046*</td>
</tr>
<tr>
<td>Selection Exam</td>
<td>0.000</td>
<td>0.000</td>
<td>0.035*</td>
</tr>
<tr>
<td>Model 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Digital Resources Activity)</td>
<td><strong>0.216</strong></td>
<td>0.017</td>
<td><strong>0.148</strong>*</td>
</tr>
<tr>
<td>Physical resources</td>
<td>-0.007</td>
<td>0.002</td>
<td>-0.045*</td>
</tr>
<tr>
<td>Selection Exam</td>
<td>0.000</td>
<td>0.000</td>
<td>0.034*</td>
</tr>
<tr>
<td>Audiovisual resources</td>
<td>-0.002</td>
<td>0.001</td>
<td>-0.024*</td>
</tr>
</tbody>
</table>

A=Lower digital resource activity
B= Average digital resource activity
C= Higher digital resource activity

### Conclusions

Preliminary results coincide with international literature in this area. The results show that the use of the library is associated with student performance. The use of digital resources provided by the library shows an impact on student learning. There is a positive relationship between grade point average (GPA) and access to e-resources (EZproxy). Those students who log in and spend more time accessing digital resources tend to increase their grade point average.

There is a weak positive association between printed and audiovisual material loans and grade point average.

The results presented in this study also generate further questions that will be addressed by future work. One challenge is to explore whether there are disciplinary differences in usage patterns. Another is to explore low usage of e-resources. At present, we can identify who is accessing the e-resources from outside the university networks only (since access from within the university does not require logging in). Our future work will go in this direction.

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Evaluating the Impact of Library Renovation: A Multiple Methods Approach

Elizabeth C. Habich and Karen Merguerian
Northeastern University, USA

In 2012–13, Northeastern University renovated the first and second floors of Snell Library. Converting somewhat tired traditional study space into a bright, modern, computer-rich environment seemed like a good idea. But did it have a positive impact on the effectiveness of library use, study patterns, and student satisfaction, or was it just a photo-op success? And could we successfully evaluate it with limited resources, sometimes imperfect data, and more questions than answers?

We will start with some background about Northeastern and the history of assessment within the library, and will then discuss the assessment methods used before, during, and after the renovation project to gauge what students wanted, and how they felt about and were using the finished product. We will also discuss how the use of multiple methods have given us a deep, rich understanding of post-renovation use, and how the limitations and strengths of the specific methods used informed interpretation of results.

We will also discuss plans to round out our current results with further assessment work, and how we have used and plan to use what we learned.

Background

Northeastern University

Northeastern is a large private school located in the arts and cultural area of Boston, Massachusetts. “Founded in 1898 with a regional focus, it has become increasingly competitive and global. It now offers undergraduate and graduate programs leading to degrees through the doctorate in nine colleges and schools—and select advanced degrees at graduate campuses in Charlotte, North Carolina, and Seattle.” Over the past ten years, the rate of change has accelerated, becoming increasingly competitive, research-oriented, and scholarly. We now enroll over 33,000 students (nearly 28,000 FTE), with about a third of these being graduate students. Almost 90% of undergrads and half of grad students attend full-time, and an even higher percentage both attend full-time and live on campus.

Snell Library

Snell Library opened in 1990, as part of the university’s commitment to transform itself from a regional school to a national powerhouse. Although the campus has a separate Law Library and a small library serving the African American Institute, Snell is the university’s only main library. Significantly for the library, over the 20-plus years since Snell opened, the way study and learning take place and the nature of scholarly communications have both changed.

Assessment and Planning in the Library

The NU Libraries have been engaged in some sort of systematic assessment for ten years.

The LibQUAL+® survey was administered in 2004, 2007, and 2010. The LibQUAL+ study helped us understand what different user groups expected from the library and where gaps between desired and perceived levels of service lie. Undergraduates value the library as a place, faculty value the library as an information resource, and graduates value both.

In 2007–2008, its first assessment plan was drafted with the participation of department heads, and the concept of outcomes-oriented assessment was introduced. Later in 2008, the READ-scale was used to assess the level of queries handled at service points throughout the building, and we used it to make decisions about the appropriate level of staffing at reference and circulation desks.

All of this was used for external purposes for the first time in 2008 as the library prepared its pieces for the university’s decennial NEASC accreditation visit.
2012 was a watershed year: following these assessment-intensive projects, a decision was made to beef up the library’s assessment infrastructure:

- Karen Merguerian became the library's first user engagement and assessment librarian.
- Late in 2012, the assessment team was revamped, with four members each charged with being the point person for assessment of a specific area: the online user experience, building use, circulation and ILL, the collections, and library instruction.

The assessment team now focuses on one or two major questions or areas each year, and approaches them with various assessment tools. Their first year’s focus was assessing building use.

In December 2013, Northeastern University finished renovating Snell Library’s first two floors. The Digital Media Commons project, in which both the library and Information Technology Services were partners, transformed traditional library study space into bright, engaging, technology-rich space. The project was conceived around the ideas that:

- non-text material were emerging as important forms of scholarly communication, that
- collaborative and informal study was important, and that
- services should be designed around the needs of end-users, not organizational structure.

We wanted the end product to signal visually that the services available inside were fresh, engaging, digitally savvy, and put the user first.

**What did we want to know?**

After several years of planning, nearly two years in renovation, and a significant financial investment, the planning team and the university were eager to know whether our work had paid off—was the DMC having a positive impact on the effectiveness of library use, study patterns, and student satisfaction. At the same time, the library itself wanted solid information on the demographics of library users, information basic to planning library space and services, communications, and the university’s budget model, where a “tax” on colleges supports cost centers, including the library. We also wanted to know what users did when they came to the library, what “going to the library” meant to them, why users preferred the library to other places on campus, which types of seating were preferred (and why), and the impact the library as space had on our users.

Our multiple methods approach takes assessment information from a variety of qualitative and quantitative sources. Over the course of the project, we collected and analyzed comments made about the renovations through a variety of channels:

- we held two town meetings;
- carried out three surveys related to our library and commons facilities;
- completed occupancy counts: walking through the building and counting where users are sitting and what activities they are engaging in;
- analyzed entrance gate data collected when students swiped their cards in our system; and
- we ran reports on the use of our group study rooms collected from EMS, our reservations scheduling system.

Going forward, we hope to be able to:

- use LabStats to get real-time data on student use of computers;
- incorporate data on student use of services;
- hold focus groups; and
- relate our data to student learning outcomes.

The renovation took place in two phases; phase one was in summer 2012 and phase two in spring–fall 2013, with the second wave divided into three sub-projects. In spring 2013, prior to phase one, we conducted a survey of student seating preferences. After phase one, which created the Digital Media Commons, we conducted a survey of technology usage and preferences.

Our initial survey, done prior to the creation of the Digital Media Commons, asked students what types of space and furniture they preferred for studying. The most common response was “tables,” expressed by a plurality: 25% of respondents. Students also expressed a desire for more outlets, better printers, and bookable group study facilities.

These results may surprise those who expect students to express more innovative ideas. We think there are two reasons students seemed to want traditional furniture. First, there is only one library (plus a small law library with more limited hours), and it can be difficult to find work and study space on our busy urban campus. Second, while surveys are wonderful for answering...
questions that can be rapidly answered or selected in writing, they are not appropriate instruments for engaging the respondent’s imagination. The focus group or interview, where conversation can flow more easily than in writing, is a better tool for that purpose.

With the opening of the second floor of the library, we began collecting and preserving comments and reactions from a variety of sources. We put out rolling whiteboards and wrote: “Let us know what you think!” on them, and then photographed and transcribed the responses. We put out a traditional wooden box with paper slips. We collected feedback from an online form on the commons web site, and we collected Twitter and Facebook comments. We also asked staff to pass along comments from end users.

Comments were transcribed into a database. This was useful for analysis and the creation of a report a couple of months after the opening, summarizing the trends. The limitations of comment analysis are that it is difficult to keep the tracking going over time, especially after the initial excitement dies down. Not every thing can be tracked and so it is not possible to say if the results, which must be a sample, are valid. It is not easy to separate comments about the commons from comments about the library, the research process, and other related services. Finally, our comments usually have no demographics.

Analyzing and sharing comments was useful for spotting specific problems, such as cleanliness and the constant need for a supply of markers for whiteboards. Comments also helped us understand some big-picture issues, for example, what aspects of the space to emphasize and de-emphasize in our communications. Students didn’t seem to know what software was available in the commons, so we publicized the advanced GIS and animation software. We also de-emphasized the number of large screen and dual screen monitors, because students perceived those as extravagant and wasteful of their tuition money, an issue we were already aware of—the excessive use of large screens was a campus flashpoint. From the comments, students told us they preferred supportive office chairs over couches, soft seating, and barstools.

Respondents appreciated the refreshed look and contemporary design and they reiterated what they had said in the survey about wanting large tables.

• Due to the speed with which the commons projects were approved and built, there was not a lot of time to incorporate student voices into the planning process, which was already underway even before we did our surveys. The library was criticized for this, and to improve in this area, we have held two town meetings, at which the dean of libraries and vice president, ITS have taken questions directly from a student audience. Other participants included staff from facilities, ITS, and the library.

• We chose this method first because student government was enthusiastic about a town meeting and was able to assist us substantially in recruitment and publicity. Pizza was served!

• Also university leadership accepts the town meeting process and structure; town meetings are common on the campus, so senior staff were supportive, and participated. In fact, they seemed to enjoy the opportunity to speak directly to students, which can sometimes be difficult for busy senior administrators.

• At the town meeting itself, comment cards were provided, as some students enjoy hearing directly from university leadership but are shy to speak up in public and ask questions themselves. Follow-up was done via e-mail afterwards.

• We recorded and transcribed the meetings so everyone in the library could read or listen later.

• It was a highly visible way to show that the library and ITS leadership are open to listening to student concerns.

In our first town meeting, held after the DMC was created and before the first floor was renovated, printing was a major concern. Students expressed frustration with long lines at printers, and they wanted color printing. Although ITS was aware of this, it was news to the library. We did not expect that and had not prioritized it for the commons. Hearing this allowed us to add substantial printing infrastructure in the second round of renovations. ITS also learned that there was a need to support android devices on the print management system.

Students told us about problems with enforcement of the group study room booking process—
some rooms were occupied without bookings, or were occupied by single students instead of groups. As a result, we have done more work to enforce and promote the booking system and the requirement that rooms be occupied by groups only.

The reverse was true for high-end computer workstations designed for graphics composition and editing. Some students were using them for studying without actually using the (very expensive) computers, so students who needed access to their specialized capabilities were not able to use them. We have since made workstations bookable to mitigate that problem.

Students continued to complain about the need for quiet after the second town meeting, so we promoted our text messaging service as a way of discreetly reporting infractions. During exams, we actively monitored quiet spaces to ensure they were quiet.

Student involvement in the decision-making process was desired; the town meeting itself was a good response to that. In fact, we promoted the fact that we held a town meeting subsequently. The perception that we are listening to students is as important as actually listening to students. The medium is the message.

Following the first phase of renovations, we carried out a technology survey with the primary goal of informing technology purchases for Phase Two. Again we heard about the need for tables for groups to work together and spread out. Students continued to complain that when they were in groups, they could not find a place to work over 50% of the time.

The individual versus group dynamic was complex, however. Students also want quiet space. Furthermore, the same student may need group space sometimes, and individual space at other times. The curriculum can drive the need: our business school relies extensively on group projects so business students tend to work more in talking groups. In other colleges and departments, students may come to the library to study quietly together. This is what is sometimes called the “studying along” phenomenon, students studying in one another’s company for motivation, but not working together or talking.

Another complex finding involved laptop and workstation use. Students told us they were bringing their own laptops to the library. But we also knew that workstation use was high. We believe what is happening here is they need high-end or specialized software that is only available to them on the campus network. Most use of the workstations was for web browsing and use of standard productivity software. Paradoxically, the Digital Media Commons was not being used much for digital media creation—the reason for its being! We think that was partly because of the overall shortage of seats in the library, partly due to the shortage of general computing seats, and partly because word had not gotten out about the specialized capabilities. Among those students who were using the DMC’s specialized software, more used the video and graphic design software, much more than data and GIS software. We believe this was because the GIS workstations were not ready for the opening of the commons, so students were not as aware of their availability. We have tried to do more promotion of GIS software and services since that time.

Phase two of the renovations, completed in the fall of 2013, was a substantial reconfiguration of the first floor of the library and additional changes on the second floor.

On the first floor, we added high-density computing, created 25 technology-enhanced group studies, added print stations, put in a reading area with casual seating, and combined the library circulation desk and the ITS help desk into a single service point. On the second floor, the DMC recording and 3D studios, and the Digital Scholarship Commons, an area for faculty and doctoral students, were created.

Again, we collected comments, held a town meeting, and did a follow-up survey to gauge satisfaction and learn what students would like to see going forward with future renovations. Again, we heard about the preference for tables. The traditional tables and carrels have been replaced with casual, soft seating and quite small arm-rest-sized tables. There were complaints that groups who could not find space or disliked the furniture on level one were moving to quiet floors and being disruptive. Students began to show mixed feelings about the library as place. Should the library be a place for quiet reflection, hard work and
concentration? Or a hub of innovative activity done in groups and designed for the cross-fertilization of ideas?

On our survey, we asked a key question on this issue. What are you looking for when you come to the library? What we found was that students are looking for the infrastructure to get work done: printers is the first answer, followed by distraction-free space for groups and individuals 24/7, practical, comfortable furniture, power, and Internet access. Of all the core library functions, it is the provision of comfortable, convenient, inspirational space with reliable technology in which to get work done that students value. Other core library functions such as access to information and research support are no longer the main reasons students come to the library. This is one reason we want to explore this question further.

To better understand how students use the building, we used Suma, open source software developed at NCSU, to do occupancy surveys. The first was a very detailed observation in the commons at several times of day over several days in March of 2013. We counted what equipment each patron was using, and what they were doing, including eating or sleeping.

The second time we counted over a period of several weeks and included the entire building. This followed our second survey, in which students complained about the shortage of tables and impracticality of soft, casual seating, and so in this observation we counted what type of furniture was being occupied on each floor. Occupancy counts are helpful in observing how students really use a space—as opposed to what they claim on a survey. For example, on our surveys, students said the new level one was their least preferred floor, but in fact it has the highest occupancy rate, due to the lab-style high-density computing. Using multiple methods sometimes allows us to see multiple dimensions of an issue!

Some of the limitations of using observations and counting are:

- Counting requires maturity and attention to detail
- Important to count at non-busy as well as busy times in order to observe seating preferences when a space is empty
- A large sample set may be required if range of counts is large
- The more detail sought, the more intrusive the counting process

Our observations in the commons revealed that most students were bringing their own technology to the commons, consistent with what they told us on the second survey, sometimes using it in conjunction with commons technology. We also learned that tables are popular on quiet floors, because groups are often “studying along” even if they are not working together on a project.

Finally, we have booking statistics that show our group studies are booked 64–80% of the time, depending on the day of the week, but we do not know if that means they are occupied. Observations shows they are 38–45% occupied, and informal observation continues to show singles in the rooms, so we know we need to do a better job of enforcement and promotion.

Entrance data

We still did not actually know who was using the library building, a basic question we needed to answer, particularly since the university operates on a hybrid version of Resource Centered Management, where funding for the library comes from a centrally-administered tax assessed on the colleges, which generate tuition revenue. A complaint we heard from some colleges, such as engineering, was that their students “never used the library,” with the implication that they should not be taxed to support the library. Beyond politics, knowing who our users are would help us understand who is consuming our services—another step towards understanding whether there are groups we are not adequately serving, and how to position our services.

The Northeastern ID, or “Husky Card” had been required for library entry for some time, but before the renovation, we knew that not everyone was “swiping in.” As part of the renovation, turnstiles were installed which opened only when a valid ID was swiped, and we worked intensively with the central HuskyCard office to refine the parameters used to allow or disallow entrance to the building to reduce incorrect “denials.” The result was that when the building opened, we finally knew we were getting a much more complete picture of who is coming into the building: their university
status, student colleges and departments, and date and time.

However, entry to the building does not necessarily correspond to use of the library, its core services, or collections. The library building also includes a café, printers, bookable space for campus events, and non-library/non-commons services such as the university’s center for teaching and learning, not all of which are related to the library or the commons.

We do know that over 90% of students entering the building are full time. Of those, 25% are graduate students and 75% are undergraduates, which reflect the population of the university just about exactly. We also know that relative to their population, students at our College of Professional Studies, who are not residents, are underrepresented in the library building. And, in wonderful irony, students in the College of Engineering are overrepresented among library entrants.

What is the value of this information? We have not been using it to develop services, but it should help us to do that going forward. It also has important political and promotional value. Our College of Engineering now knows their students are heavy library users, and it turns out our engineering college is not alone. In the Ithaka survey of faculty perceptions of the library’s role on postsecondary campuses, science faculty perceive the library role, beyond licensing content, as increasingly unimportant on university campuses. This data shows that at least at Northeastern, the same is not true of their students, whose relationship to the library as a place is very strong.

For our library, a significant effect of using multiple methods was that the feedback we received using one instrument was confirmed by another, so we could feel more confident taking action on what we were hearing.

Here are some of the actions we took:

- Made Digital Media Commons workstations reserveable
- Added printing stations in the second round of renovations
- Did not add dual monitors in the second round of renovations
- Advertised what software was available
- Added tables for groups to upper floors of the library
- Promoted and enforced quiet on upper floors of the library
- Provided occupancy counts to Student Government to advocate for more extended hours for on-campus shuttle
- Created a library Student Advisory Board: a monthly forum for consistent, ongoing conversations with students

From the beginning our students have voiced the need for large tables to spread out, and seem to take particular offense at the coffee tables; students actually attempted to stack coffee tables to create a “normal height” workspace. As a result of this feedback, standard height tables will replace coffee and barstool height tables in study spaces. We have also added tables to our fourth floor, a traditional library quiet space.

- Even though a little over 50% of students bring their own laptops to the library, the high occupancy of our commons lab environments shows there continues to be demand for workstations.
- At peak times, such as early in the morning and at noon, there are long lines at the printers. It seems students are printing out lecture slides before attending classes, but we are wondering if there is another, less wasteful, alternative?

So here we are in the summer of 2014. Where do we go from here? The gold standard in assessment is mixed methods research, including both quantitative and qualitative approaches. Most of what we have done so far has been on the quantitative side, and it has raised questions that can best be explored through qualitative methods. We have begun planning to do a series of focus groups in the fall to delve deeper into some of these questions, among them:

- What is the role of the library and the commons in student life?
- What research and learning support is best met in the library, and what could be met in other campus places?
- Why is printing still so prolific on campus?
- When do students need workstations? Would an expanded laptop loan program meet their needs and remove pressure for space for high-density lab computing?
- Is the need for quiet on campus increasing? How about the need for group meeting/talking space?
So, as with any good assessment program, we’ve completed one round of assessment, made changes in responses to it, and assessed again. My hope is the cycle will continue, and help the NU Libraries continue in a process of continuous improvement.

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Notes

Learning in a Library: How Active Learning Classrooms and Informal Learning Spaces Contribute to Student Engagement, Effective Teaching, and Coordinated Assessment

Amanda Hornby, Louise Richards, and Jill McKinstry
University of Washington, USA

Introduction
The University of Washington Odegaard Undergraduate Library recently completed a $16 million renovation, which received the 2014 American Institute of Architects’ Institute Honor Awards for Interior Architecture. The renovation included two state-of-the-art Active Learning Classrooms (ALCs) that encourage student engagement and active learning. The classrooms are available to students as informal learning spaces outside of scheduled class time. Given its central campus location and its role as an intellectual commons with a history of supporting students and instructors with their research, teaching, and learning, Odegaard Library was an ideal location for the new classrooms. As the first classrooms of their kind on the UW campus, the ALCs also presented an opportunity for research:
• What challenges and opportunities for teaching and learning would instructors and students perceive in these new environments?
• What could we learn that could inform best practices for active learning strategies, appropriate support plans, and future classroom designs?

A collaborative assessment team including representatives from UW Libraries, UW Information Technology, and UW Classroom Technology and Events set out to answer these questions during the 2013–14 academic year.

Active Learning Classroom Features
The largest Active Learning Classroom (136) seats 90 students at 10 round tables, each seating 9 students. The other Active Learning Classroom (141) seats 63 students at 7 round tables, each seating 9 students. The two ALCs can be connected via videoconference for class sizes of 150.

The ALCs feature:
• Writable glass-surfaces for each group
• Fixed round tables; fixed instructor podium; movable chairs
• 55-inch flat-panel monitors at each table
• Wireless connectivity and power outlets at each table
• Tables have three video ports and power for nine portable devices
• Microphones at tables and podium
• Instructor podium with dedicated PC, document camera, video camera, and Blu-ray player.

Courses Taught in the ALC, 2013–14
For the first year of ALC courses, classes were scheduled on a first-come-first-served basis and nearly all course requests were accommodated. The ALCs are a general access classroom. For the academic year 2013–14, 93 courses were taught in the ALC, ranging from the 100 to 500 level and including a wide variety of disciplines.

Previous Research on Active Learning
Active Learning Classrooms (ALCs) have generated great interest among educators, architects, university planners, and researchers, though studies directly examining the effect of these classroom designs on learning outcomes are few and vary in quality. The most rigorous studies have been conducted at the University of Minnesota, where researchers conducted quasi-experimental studies over three years, replicated with instructors teaching courses in different subjects. Controlling for potentially confounding factors (instructor, teaching methods, assessments, student demographics), the researchers found that teaching in an ALC contributed significantly to student learning outcomes (students taught in an ALC outperformed final grade expectations based on their ACT scores) and to students’ positive perceptions of their learning experiences, among
other findings. A recent UW study by Freeman, et al. proved that active learning raises average exam grades by half a letter, and student failure rates are 55% higher under traditional lecturing.²

Odegaard Library Formal Learning (ALC) Questions
The design of the Odegaard ALCs differs slightly from other ALC designs across the country. Because of architectural constraints, for example, neither room 136 nor 141 has a central screen; an instructor must send digital material to screens at each table. Both rooms also include a number of booths or “data diners” built into the window alcoves for extra seating or break out space. While the rooms included all the technological features of other ALCs across the country, we were uncertain how and to what extent these features would be used and valued by UW instructors and students. In our first year assessment of the classrooms, then, we focused primarily on understanding what, if anything, needed to change to better meet the needs of instructors and students, and what we could learn to improve experiences in the room going forward. Specifically, we sought to answer the following questions:

• What level of training is sufficient to prepare instructors to teach in the ALCs? What support is necessary for the ALCs?
• What challenges and opportunities for teaching do instructors perceive in response to the room and its features?
• What effects, if any, do students (and their instructors) perceive the room/instructors’ use of the room has on their learning?
• What physical and technological features are essential/most valued for supporting active learning?
• What advice about preparing to teach/teaching in the ALC would experienced instructors offer to others interested in the opportunity?

Odegaard Library Informal Learning Questions
The UW Libraries and Odegaard Library have a long-standing history of gathering data on our student users. This data and student feedback informed the overall renovation of Odegaard Library. We wanted to know, post-renovation, if the spaces were being used as designed. Our specific questions included:

How are students using Odegaard? We wanted to track the extent to which students were:

• working individually
• working in groups
• using whiteboards
• using shared monitors (Mediascape mobile, ALC monitors)
• using personal devices (laptops, smartphones, tablets, etc.)
• using the learning commons computers

What spaces/services in Odegaard are most important to students? We wanted to track the extent to which students used:

• quiet areas
• collaborative spaces and tools
• online/print collections
• Odegaard Writing and Research Center
• technology assistance
• course reserves

Collaborative Assessment Process
Just as cross-unit partnerships are critical to the running of the Active Learning Classrooms, so too are partnerships in this type of assessment project. The assessment team included librarians, researchers, and graduate students from the UW Libraries, UW-IT Academic and Collaborative Applications, and UW Classroom Technology and Events. Taking a team approach to assessment brings together different skill sets, such as research design, perspectives, and ensured buy-in of our partners. ALC instructors were also key collaborators throughout the assessment process and we brought them in from the beginning of the project’s research design phase.

Formal Learning Spaces: Data Collection and Analysis
We conducted our research with courses taught in the Active Learning Classrooms winter and spring quarter of 2014. In autumn quarter 2013 we piloted our methods, data collection instruments, and approach. We used a mix of methods to gather both self-reported and observer data related to our questions:

Observations
The project team conducted observations each quarter of the 2013–14 academic year, though our strategies differed. In autumn, we tested two observation forms adapted from those used
Two three-member teams observed 15 instructors/courses once during the quarter and took note of how instructors and students made use of the room and its features. In winter, the observation forms were revised, and three-member teams observed six instructors/courses three times over the quarter, focusing on instructors teaching in the ALC for a second time. For each observation, one team member recorded instructor behavior and two others each chose a table of students to observe. Notes about what instructors and students were doing and what features of the room were used were made every five minutes for the duration of the class. In spring, the same protocol was used; teams of three observed seven instructors/courses once during the quarter. In all instances, instructors were those who were willing to have their course observed; they were informed that they did not need to do anything special on the days that they were observed. All observations were conducted between week 4 and week 9 of each quarter.

Instructor and Student Surveys
Surveys were sent to instructors at the end of each quarter. They were also sent a link to the student survey to distribute to their classes. The autumn survey focused primarily on users’ satisfaction with features of the room and their perceptions of the room’s effects on teaching and learning. The surveys were revised in winter to provide more detailed feedback in regard to support for instructors, the effects of features of the room on teaching and learning, and how teaching and learning in the ALCs compared to a traditional classroom (see Appendix). The revised surveys were used again in spring.

Survey participation was voluntary; response rates were higher among instructors than students:

<table>
<thead>
<tr>
<th></th>
<th>Instructor respondents</th>
<th>Student respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn</td>
<td>14 (93% response)</td>
<td>182 (from 11 courses)</td>
</tr>
<tr>
<td>Winter</td>
<td>16 (89% response rate)</td>
<td>127 (from 15 courses)</td>
</tr>
<tr>
<td>Spring</td>
<td>13 (76% response rate)</td>
<td>130 (from 14 courses)</td>
</tr>
</tbody>
</table>

Focus groups
Focus groups were conducted with instructors at the end of each quarter to get a better sense of their experiences in the room, the adequacy of support, and what practices were particularly successful or unsuccessful in their use of the room for active learning. Four instructors attended a focus group in autumn, eleven in winter, and four in spring. (See Appendix for focus group questions.)

Data Analysis
Data from each source (observations, student and instructor surveys, and focus groups) was parsed according to specific areas of inquiry: adequacy of support, instructional goals and practices, student learning, and use of classroom features and their value. Descriptive statistics were generated for the quantitative data; qualitative data was analyzed for frequency and content of themes. In addition, where multiple sources of data were available for a single instructor/course (observations, survey responses from instructor and his/her students, and/or focus group comments from same instructor), we triangulated findings to understand how and to what extent active learning was achieved in the course.

Informal Learning Spaces: Methods
Our methods for determining student use of informal learning included an Odegaard Library-wide Snapshot Survey (previously run in 2008 and 2011), and the triennial UW Libraries in Library Use Survey. The survey response numbers are listed below:
Findings: Formal Learning Spaces

I. TEACHING IN THE ALC

Instructors need support before and during their quarter teaching in the ALC.

Before the start of each quarter, all instructors teaching for the first time in the ALC were required to attend a one-hour training on how to use the technology in the room. In addition, OUGL Library staff and members of UW-IT’s Academic Services unit were available to address problems with technology or any other aspects of access and operations as they arose. This level of support and preparation appeared adequate and appreciated by instructors: 100% of instructor survey respondents reported being “satisfied” or “very satisfied” with the training and support they received on how to operate the ALC, often mentioning that staff were very helpful. Respondents did report some technical problems during their time teaching in the room—many of these minor glitches that were resolved—suggesting that technical support for the room may be fairly equal to that of other classrooms. Other reported problems with the room (sightlines, sensitivity of microphones) or protocol (access to the room, availability of markers) were flagged for improvement (see “Actions Taken” below).

Learning to teach in an ALC takes time and motivates reflection on practice.

In our observations, we found that instructors used active learning strategies to varying degrees and to varying degrees of success. Some made little use of the features of the room designed to support collaborative learning and appeared to struggle with moving away from lecture or whole class discussion as a primary method of instruction; others made full use of nearly every feature, in classes where the activities were clearly designed to be student-centered. Some had prior experience trying active learning strategies in a traditional classroom or had spent considerable effort and time revamping their curriculum; others were simply curious about how they could use the room.

The reasons instructors gave for wanting to teach in the ALC, however, were similar. In response to the survey question “What were you hoping to achieve by teaching in an Active Learning Classroom rather than in a traditional classroom?” instructors overwhelmingly indicated that their goals were to promote increased interaction among students and student skill-sharing through small group work and team-oriented learning. Increased student discussion and engagement in activities was also a top priority for ALC instructors, with some indicating they wanted to use technology to do so. Most instructors indicated they sought to use active learning pedagogy, move away from lecturing, and increase interactions between students and instructor.

For many instructors, teaching in the ALC motivated them to ask new questions about their teaching, and about how to juggle multiple goals: “[I was] trying to be intentional: what are my learning objectives? What are the three things I want them to come away with? How can I design an activity that will get this to play out?”

II. LEARNING IN THE ALC

Instructors and students report greater engagement, participation, and interaction with peers and with instructor.

All instructors interviewed reported high levels of student interaction and engagement in their ALC classes, higher than they had observed when teaching their course in a traditional classroom. Instructors also reported higher levels of student participation, noting that even shy students spoke up in group discussions, and that discussions were deeper. As a result, instructors said that they had a better sense of where their students were—what they understood, what interested them, what they were able to do. Nearly all instructors reported that
students were more willing to work together and were open to critiquing or discussing each other’s work—activities that require a level of trust among group members.

• “I would say that they feel more engaged…This environment opens students up more for this type of engagement.”

• “By the end of the quarter I had students from all over the world, including ELL, who were normally hesitant participants are much more comfortable than in a cramped lecture hall. They stayed much more active as learners for much longer in the quarter.”

Student comments reflected similar benefits in response to the question, “How did your experience in the ALC differ from your experience in other classrooms, if at all?”

• “I was much more involved with my peers than in other classrooms, and I spent less time asking the teacher for answers and more time discussing it with my peers.”

• “In a lecture based classroom I am less engaged in class discussion. Having groups makes it easier for me to discuss in smaller groups about our views which made it easier to speak up to the rest of the class. We also got the opportunity to even speak with the professor because she was able to check in to see what kind of ideas we were coming up with.”

• “Amazing set-up for group work.”

Students report greater gains in learning than instructors when comparing experience in ALC to traditional classroom

Instructors were fairly cautious in their responses to a question that asked them, “How would you compare the learning outcomes of students taking your course this quarter, taught in the ALC, to those of students who took your course previously, taught in a traditional classroom?” Many instructors had not taught the same course previously, and all had not calculated final grades when the survey was sent. While there was some uncertainty about their students’ performance in the ALC versus a lecture classroom, no instructors thought that their students performed worse when taught in the ALC (46% in winter and 47% in spring).

In response to a similarly worded question (“Imagine you had taken this course with the same instructor in a traditional classroom. What effect do you think this would have had on your ability to learn the material?”), a majority (83% in winter and 84% in spring) of student survey respondents reported that they would have “learned less” or “about the same” if they had taken the course in a traditional classroom.

A follow up question asked students to explain their answer. Comments here suggest that students who reported that they would have learned more in a traditional classroom than in the ALC appeared to be in courses where the instructors still primarily lectured, as illustrated by this student quote: “[B] ecause so much of the class was just someone lecturing us, I feel like I learned about the same as I would have in a regular lecture hall.”

III. ALC DESIGN

Some features of the room were valued more highly than others by instructors and students.

Of the total number of instructors who responded to the survey in winter and spring quarters combined (N=30), 60% or more indicated that the following features were “essential” to achieving their pedagogical goals in the ALC:

- Movable chairs 87%
- Digital display at table 83%
- Send content to table displays 83%
- Podium laptop hookup 73%
- Student table microphone 72%
- Round tables 63%
- Student laptop hookup to display 63%
- Podium microphone 60%

Other features were rarely used; 60% or more of these same respondents indicated that they “did not use” the breakout booths (60%), the document camera (63%), lecture capture (70%), the DVD/BluRay player (73%) or videoconferencing (80%) with regard to achieving their pedagogical goals. These results suggest that new active learning classrooms with fewer technologies would still meet the needs of many instructors.

In a similar survey question, students were asked to indicate whether features of the ALCs (and their instructor’s use of them) “enhanced,” “detracted from,” or “had no effect” on their ability to learn in the course. Of the total number of students who responded to the survey in winter and spring quarters (N=257), over 60% indicated that the
following features “enhanced my ability to learn in this course.”

- Power outlets 82%
- Digital display at table 75%
- Round tables/movable chairs 71%
- Audio/microphones 71%
- Laptop hookup to displays 68%
- Overall appearance/design 63%
- Writable surfaces 61%

Student comments clearly describe how these features, and the way their instructor used them, made a difference. The digital displays at each table were mentioned by students far more frequently than any other feature. Students appreciated the fact that “everyone could see” the information clearly and up close, improving understanding and collaboration.

- “[The instructor] had us answer questions and share with the class via the screens connected to each table. This was great because everyone could see up close what we were talking about.”
- “The main thing was that there was the notes up on the big screen that we could flip back and forth to while collaborating.”

Students benefited from using the writable surfaces to capture notes, key ideas, draw diagrams and models. Less frequently, they mentioned appreciation for a TA or instructor writing notes. Some students mentioned that they wished their instructor had them use the boards more often, and that the instructor would provide feedback on this work.

- “We used the walls/whiteboards for integral thinking activities in which we hashed out issues we were having on our research proposals.”
- “The writing walls helped because you worked with your classmates to brainstorm and answer the questions or translations.”

Some student comments specifically mentioned the role of the tables in supporting group work and interaction.

- “I like how we were broken down into discussion groups. The round table really helped facilitate active and engaging discussions.”

- “I think the small group tables were beneficial when required to complete in-class activities with the group we were assigned to work with. This particular part of the curriculum allowed the focus to simply be on each other and work without other outside distractions.”

Students specifically mentioned benefitting from the ability of instructors and TAs to move around the room and check in on them. Some students highlighted the benefits of being able to connect their own laptops to the digital displays at each table. While the videoconferencing, video camera, and document camera features were not widely used by instructors, students commented that they were used to great effect when they were supporting communication.

- “It was nice to have enough space for the professor to roam around.”
- “Each group got their own screen and we were allowed to pull up things ourselves.”

The design of ALC makes some aspects of teaching and learning challenging. Almost all instructors teaching in the ALCs still integrated some degree of lecture in their classes, and it was here that they noted the greatest challenges with the design of the room. Without a central screen, instructors found that they were often lecturing to the backs of student heads, turned to face the table screens. In our focus groups, instructors talked about how important it was to make eye contact with students as a way of checking comprehension. In addition, those who were used to using a pointer to reference parts of slides when lecturing found that they were unable to do this without a central screen. Others described students’ awkwardness in having to turn away from someone they were talking to (a professor or a classmate) in order to use the tabletop microphone. Instructors also noted problems with some of the table displays blocking their view of some students from the podium.

Students, too, had negative reactions to particular features, though these were relatively few. The feature that received the greatest number of responses for “detracted from my learning” was “open floor plan” (10%). Next were “round tables/movable chairs” (9%), and “digital displays at table” (8%). Comments from students suggest that these ratings reflect (1) screens blocking sight
lines to instructor or other students; (2) an inability to see the screen from their seat at the table (especially when table is full); or (3) frustration in not knowing where to look when an instructor discussed slides: “I actually found the room actually [sic] very frustrating. I consistently felt as if I was trying to get comfortable in room, either because I couldn’t see the screen (with a head in the way) when the professor was lecturing, or I couldn’t hear someone because the mics weren’t working or people forgot to use them, etc.”

IV. BEST PRACTICES
All instructors who responded to our survey noted that there were things that they would do differently if they were to re-teach their course in the same room in the future, suggesting that active learning strategies require practice and refinement. Many instructors indicated that they would **restructure the small student groups**, making changes to enhance group dynamics, build-in group work skills throughout the course and mix up groups more to enable the whole class to work together. Most instructors commented that they would **implement the use of the different ALC features early on** and introduce the ALC technology from the very start of the class. Some instructors mentioned in the future they would **allow more time for course planning** and plan for more time to practice using the technology features for course activities. Common themes around best practices emerged from these discussions:

1. **Orient students to the ALC and to active learning**
   In focus group discussions, several instructors observed that their students were not prepared to participate in an active learning classroom and often arrived with different expectations. Experienced ALC instructors advised new instructors to clearly explain how their class would be structured differently in this room, and to coach students on how to engage in active learning and with the ALC features.

2. **Be intentional in the use of group work**
   Instructors valued the group work focus of the ALCs, but many reported challenges: What was the best group size? Should students stay in the same group, or change? Should groups be free-forming or assigned, and how should group dynamics be monitored? When was a group activity “done?” Instructors advised spending more class time getting students comfortable with each other so that they could have productive group discussions. ALC instructors should plan to “spend some time having the students getting to know each other rather than just throwing them into group work together.”

   Others observed that students benefitted by having defined group roles, or having some ground rules for how they would work together: “I assigned roles the first day of class the first quarter. I asked them to do a short survey. Assess the category you feel most comfortable. [Roles included] table manager (to keep track of time); table IT role (help out with technology at the table), etc. For each table they had a role depending on [their response to the] survey.”

3. **Seek advice and guidance in adopting active learning strategies.**
   While teaching in the ALC may have presented a mix of opportunities and challenges, almost all the instructors we spoke with wished to teach again in the new classrooms. Several said they wanted the chance to iterate on and refine new practices. Many instructors expressed a desire to share best practices for teaching in the ALCs with other ALC instructors. In the course of discussing how and to what degree they had prepared to teach in the ALC, instructors mentioned a range of helpful resources, including the Teaching with Technology Fellows Program, Faculty and Professional Learning Communities (FPLC) through the Center for Teaching and Learning and UW Libraries, onsite staff and online guidelines for structuring effective group work. One piece of advice that many instructors agreed with: “revamp [your curriculum] in baby steps.”

Findings: Informal Learning Spaces
Overall, we found that 90% of Odegaard Library users are UW undergraduates, and there was a 122% increase in the number of library users in 2014 over 2011. Our two methods, the Snapshot Survey and In Library Use Survey revealed parallel results:

- Individual workspace remains critically important: a 70/30% distribution of individual and group study was observed.
• Students study alone both in the designated quiet third floor and on the collaborative first floor.
• 40% to 60% of students use personal devices, depending on the time of day.
• Access to online/print collections, assistance from staff, lab computers, and collaborative tools also all ranked as important or very important.

Action Taken: Year 1 Modifications to the ALCs
Several immediate actions have been taken to improve student and instructor experience in the ALCs as a result of the assessment project:
• Instructor orientations and training materials have been updated and include a “best practices for teaching in the ALCs” document.
• ALC course reservation policies have been created to give priority to instructors whose course plans meet the criteria for active learning.
• ALC operations have changed based on instructor feedback.
• Additional technology supplies were purchased for use by instructors and students, including 40 adapters for connecting student devices to the tables, and 9 tablets with styluses.
• The ALC partners, UW Libraries, UW-IT Classroom Technology & Events and UW-IT Learning Technologies have a clarified and improved support framework.

Future Directions
Our research and the continuous improvement of the ALCs will continue into the 2014–15 academic year and beyond. Future directions include:
• Continue to assess student and instructor experiences in the ALC.
• Investigate the experiences that best prepare instructors to teach successfully in the ALC.
• Collaborate with instructors of select courses to learn more about the ALC student learning experience.
• Offer student orientations to the ALCs.
• Create structured opportunities for ALC instructors to share resources and observe one another’s teaching.
• Foster a community of instructors and other individuals interested in active learning.
• Odegaard Library will continue collaborative assessment on informal learning spaces, with a refinement of instruments and further data analysis.

—Copyright 2015 Amanda Hornby, Louise Richards, and Jill McKinstry

Special thanks to Janice Fournier for her contributions.

Endnotes
Appendix 1: Assessment Team Roster

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<th>Unit</th>
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<tbody>
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<td>Jackie Belanger</td>
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<td>Alaina Bull</td>
<td>UW Libraries</td>
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<td>Yiting Chu</td>
<td>UW-IT, Academic &amp; Collaborative Technologies</td>
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<td>Janice Fournier</td>
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<td>Alex Rihm</td>
<td>UW Libraries</td>
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Appendix 2: Classroom Observation Forms

*See directions for completing this form on other side*

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<tr>
<th>Time (5 min intervals)</th>
<th>Instructor &amp; TA activity</th>
<th>Technology</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mark &quot;I&quot; or &quot;TA&quot; (and # necessary)</td>
<td>Display-mark &quot;D&quot; or &quot;S&quot; for source of content</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consulting</td>
<td>Other</td>
<td>Comp., Laptop</td>
</tr>
</tbody>
</table>

Observer: 
Room #: 
Course: 
Instructor: 
Date & Time: 
# of TAs:
Instructor Form:
- Record at 5-minute intervals what instructor and TAs are doing and what technology/features of room are being used (see form).
  - **LECTURING** = Instructor (or TA) is presenting to students as a whole group
  - **FACILITATING DISCUSSION** = Instructor (or TA) is engaged in discourse with students as a whole group (e.g., asking questions, listening to their responses, or answering questions from students)
  - **ROAMING/OBSERVING** = nonverbal activity; may include listening in on a group or watching for raised hands, etc.
  - **CONSULTING** = instructor (or TA) is interacting with individual student or group of students
- For DISPLAY record "I" (instructor) or "S" (Student) for the source of content being displayed at tables.
- Record "I" or "TA" to indicate who is doing what; indicate NUMBER of TAs where necessary. For example, if two TAs are consulting with students, record TAs (2) under the column "consulting."
- Use "comments" to explain activities. If you use more than one line for comments, indicate the time interval to which the comment belongs.

Instructor Map:
- Record placement of instructor ("I") at each 5-min interval and RECORD TIME next to the "I". Do the same for any teaching assistants ("TA").
- If instructor is interacting with a group of students other than the whole class at that time interval, placement of these students ("X") can be indicated on the map as well.

<table>
<thead>
<tr>
<th>Odegaard ALC Observation Form: STUDENTS- SINGLE TABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observer: _________________________________________</td>
</tr>
<tr>
<td>Room #</td>
</tr>
<tr>
<td>Instructor: ________________________________________</td>
</tr>
<tr>
<td>Date &amp; Time: ______________________________________</td>
</tr>
<tr>
<td>Table #: _______; # of students at table: _______</td>
</tr>
</tbody>
</table>

*See directions for completing this form on other side

<table>
<thead>
<tr>
<th>Time (6 min intervals)</th>
<th>Whole/ Large/ Small</th>
<th>Of task</th>
<th>Individual work</th>
<th>Student/ class</th>
<th>Student/ instructor/ TA</th>
<th>Technology</th>
<th>Display—mark &quot;I&quot; or &quot;S&quot; for source of content</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td></td>
<td></td>
<td>Laptop</td>
<td>Display</td>
<td>Mic</td>
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</tbody>
</table>

499
Students-Single Table Form:

- Choose one table of students to observe; record the table number on observation sheet. Be sure to choose a table where you can view the screen.
- Record at 5-minute intervals what students at the table are doing what technology/features of room are being used.

**TABLE ACTIVITY**

- **COLUMN 1:** Record "whole," "small," or "large" for the type of activity that is happening at the table:
  - Whole = the whole class is engaged in a discussion or listening to the instructor
  - Small = the students at the table are engaged in a small-group activity (2-3 students working together)
  - Large = the students at the table are engaged in a large-group activity (4-6 students working together)
- **OFF-TASK:** Record the NUMBER of students who you can reasonably assume are off task (e.g., you can see they are looking at something on their laptop that is not related to class). Do not make assumptions about students whose work you cannot see.
- **INDIVIDUAL WORK:** Record the NUMBER of students who are working individually at the table you are observing.
- **STUDENT/CLASS:** Mark an "X" in this column if a student at your table is presenting to the class as a whole, or asking a question in a whole class discussion. OR if students at your table are listening to a student at another table do this. Explain in comments.
- **STUDENT/INSTRUCTOR/TA:** Mark an "X" in this column if one or more students at your table is interacting with the instructor or TA in any way. Explain in comments.
- Use "comments" to explain activities. If you use more than one line for comments, indicate the time interval to which the comment belongs.

**TECHNOLOGY:**

- **LAPTOP:** Record the NUMBER of laptops being used at that time interval (classwork or otherwise).
- **DISPLAY:** Record "I" or "S" for the source of content on the display (I=Instructor; S=student).
- **MIC:** Mark "X" if a student at your table is using a mic
- **WHITEBOARD:** Mark "X" if one or more students at your table are using a whiteboard
- **BOOTH:** Record the NUMBER of booths students at your table are using at that time interval.

**Single Table MAP:**

- Record placement of students ('X') at table at start of class and, if relevant, placement of student laptops.
- If students have moved substantially at any of the 5-min intervals, indicate their new placements on the map and RECORD THE TIME next to their new 'X'.

500
Appendix 3: Instructor Survey
Thank you for taking this survey. Your responses will improve support for instructors using the Active Learning Classrooms and inform recommendations for new classroom designs. This survey should take about 5 minutes to complete.

I. Support and Operations
1. How satisfied were you with the training and support you received on how to operate the Active Learning Classroom?

- Very satisfied
- Satisfied
- Dissatisfied
- Very dissatisfied

2. What challenges, if any, did you encounter in the day-to-day operations of the ALC?

3. What suggestions would you offer to improve the training, support, or operations around the ALC?

II. Teaching & Learning in the ALC
4. Do students meet regularly for your course outside of the hours scheduled in the ALC?

- No, all class sessions take place in the ALC
- Yes--some class sessions are scheduled in a traditional classroom or lecture hall
- Yes--students meet in quiz sections one or more days a week in a different classroom
- Yes--this is a hybrid course; some class sessions take place online
- Other:

5. What were you hoping to achieve by teaching in an Active Learning Classroom rather than in a traditional classroom?

6. How successful would you say you were in achieving these goals?

- Very successful
- Somewhat successful
- Unsuccessful

7. What, if anything, would you do differently if you were to re-teach this course in the same room in the future?
8. The Active Learning Classroom includes a number of physical and technological features designed to support active and collaborative learning strategies. Reflecting on your experience this quarter, how would you rate each feature in regard to achieving your pedagogical goals?

### a. General space

<table>
<thead>
<tr>
<th>Feature</th>
<th>Essential</th>
<th>Useful</th>
<th>Problematic</th>
<th>Did not use/NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open floor plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Round tables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Movable chairs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writable surfaces</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Break-out booths</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### b. Instructor podium

<table>
<thead>
<tr>
<th>Feature</th>
<th>Essential</th>
<th>Useful</th>
<th>Problematic</th>
<th>Did not use/NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laptop hookup</td>
<td></td>
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<tr>
<td>Microphone</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Ability to send instructor/student content to table displays</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Document camera</td>
<td></td>
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<tr>
<td>Blu ray video player</td>
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<td></td>
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<td></td>
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<tr>
<td>Lecture capture</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Videoconferencing</td>
<td></td>
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<tr>
<td>Audio control</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lighting control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
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</tbody>
</table>

**Optional:**
- **Pedagogical goals:**
### c. Student tables

<table>
<thead>
<tr>
<th>Digital display at table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability for students to connect laptops to display</td>
</tr>
<tr>
<td>Table top microphone</td>
</tr>
<tr>
<td>![Essential <img src="Useful" alt="Useful" /> <img src="Problematic" alt="Problematic" /> ![Did not use/NA](Did not use/NA)</td>
</tr>
</tbody>
</table>

9. How would you compare the learning outcomes of students taking your course this quarter, taught in the ALC, to those of students who took your course previously, taught in a traditional classroom?

| ![I did not teach this course previously](I did not teach this course previously) |
| Students taught in ALC learned more/performed better than students taught in traditional classroom |
| Students taught in ALC learned less/performed worse than students taught in traditional classroom |
| Students taught in ALC learned/performed about the same as students taught in traditional classroom |
| Don’t know |

10. Is there anything more you would like to tell us about your experience teaching in the ALC?

11. Your class(es): [drop down list]

Thank you for your feedback!
Appendix 4: Student Survey

The two new Active Learning Classrooms (ALC) added to the Odegaard Library are new classroom designs, and we're eager to hear your feedback. Tell us what impact they've had on you and your learning. **Results of the survey will help us make recommendations for future classrooms.**

This survey should take about 3–4 minutes to complete. Your participation is voluntary (but highly encouraged!); your instructor will not know who has or has not taken the survey. Thanks!

1. How did your experience as a student in the Active Learning Classroom differ from your experience in other classrooms, if at all?

2. The Active Learning Classroom includes a number of features designed to support learning. What effect, if any, did each of these features (and the way your instructor used them) have on your ability to learn in this course?

<table>
<thead>
<tr>
<th>Feature</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open floor plan (ability for instructor/TAs/students to move about room)</td>
<td>Enhanced my learning</td>
</tr>
<tr>
<td>Round tables and movable chairs (ability to form flexible groups)</td>
<td>No effect</td>
</tr>
<tr>
<td>Digital displays at table (ability to share instructor or student content)</td>
<td>Detracted from my learning</td>
</tr>
<tr>
<td>Laptop hookup to displays (ability to share content at table/with other tables)</td>
<td>Enhanced my learning</td>
</tr>
<tr>
<td>Audio/ microphones (ability to hear/be heard by other students and instructor)</td>
<td>Enhanced my learning</td>
</tr>
<tr>
<td>Writable glass surfaces</td>
<td>No effect</td>
</tr>
<tr>
<td>Break-out booths</td>
<td>Detracted from my learning</td>
</tr>
<tr>
<td>Lighting</td>
<td>No effect</td>
</tr>
<tr>
<td>Power outlets (tabletop and wall)</td>
<td>Enhanced my learning</td>
</tr>
<tr>
<td>Overall appearance/interior design of classroom</td>
<td>No effect</td>
</tr>
</tbody>
</table>

3. Describe one way your instructor used the features of the Active Learning Classroom that was especially helpful to you and your learning.

4. In what ways, if any, do you think your instructor could have made better use of the features in the Active Learning Classroom for teaching this course?

5. Imagine you had taken this course with the same instructor in a traditional classroom. What effect do you think this would have had on your ability to learn the material?
6. Please explain your answer to the previous question.

7. How has your experience as a student in this class influenced your use of the ALC outside of class? Select all that apply:

- I have not used the ALC outside of class
- I have used the ALC to study individually
- I have used the ALC to study with a group
- I have used the technology in the ALC
- I have met with my TA in the ALC
- Other:

8. Is there anything more you would like to tell us about your experience in the Active Learning Classrooms?

9. Your class: [drop down list]

Thank you for your feedback!
Appendix 5: Focus Group Questions
How do you define active learning?

Did you see any effect on students as a result of being taught in the ALC?

What, if anything, did you change in your lesson plans or assignments in order to take advantage of the features of the ALC?

Was there a specific technique you used or activity that you designed that led to a successful outcome?

Was there a time when a particular activity failed to result in active learning? Describe.

What advice would you give a new instructor as they were preparing to teach in the Active Learning Classroom?
Assessment in Space Designed for Experimentation: The University of Washington Libraries Research Commons

Lauren Ray and Katharine Macy
University of Washington, USA

Abstract
Since opening in 2010, the University of Washington Libraries Research Commons has used a number of quantitative and qualitative assessment methods to evaluate its space, services, and programs. Because it was designed for constant experimentation and change, Research Commons assessment has been driven by the desire to stay true to user needs, make the case for growth, and test new models of space design, programming, and services. This paper will describe assessment activities and projects kept in spirit with the experimental, agile nature of the space and how the focus shifted from space assessment to programmatic assessment. In order to respond to changing user needs and push for innovation, the Research Commons has evolved to examine space, services, and programs in an integrated holistic manner. This has allowed the staff to not only understand what users do within the space and their preferences, but also how effective programming and services offered are at meeting those user needs.

Introduction
The UW Libraries Research Commons opened in 2010 and was designed as a collaborative space focused on supporting the research process and fostering interdisciplinary connections. It is also intended as an experimental space that allows the UW Libraries to innovate as it tests programming, services, and space design. Considering the primary focus and mission of the Research Commons, assessment must consider not only the physical space itself, but also the services and programming being offered.

Assessment in libraries is evolving from a focus on collections, utilization, and services to user-centered outcomes. In recent years, there has been an effort in our field to examine the tying of space assessment to student learning. Referring to Pine and Gilmore’s The Experience Economy, Forrest and Bostick suggest in their article “Welcoming, Flexible, and State-of-the-Art: Approaches to Continuous Facilities Improvement” that libraries can view themselves as transitioning into the experience-based economy, in which the total customer experience becomes central to measuring success. Beyond just evaluating patron interactions with resources and services, research libraries are increasingly looking at how these things impact user outcomes such as the transformation of student learning and improvement in the quality of research. This transition moves library staff from the role of gatekeepers and assistants and into the role of collaborative partners. They point out that a decline in large-scale financial investments in library facilities renovations, combined with this emphasis on user outcomes, forces libraries to innovate our spaces and services on a more rapid cycle.

In his essay, “Flip the Model: Strategies for Creating and Delivering Value,” Mathews argues that in today’s constantly changing information and learning environment, librarians need to have an eye for innovation and must continually reexamine their roles to adjust to users’ needs. Libraries must continually evaluate how they create and deliver value. Considering the nature of the Research Commons as an experimental space designed to evolve and change, it is critical to design and continually evaluate our assessment to ensure that the space and programming are measuring for the desired outcomes. Assessment in an experimental space can act as applied research, allowing for incremental improvement to services and programs.

Nitecki argues that in the experience-based economy, library spaces are an important factor to consider as librarians move into the new roles of collaborator and facilitator in learning and creating knowledge. The value of space, physical or virtual, can only be determined in how it supports the activities and experiences of its users, and
assessment should be designed to take that into consideration. This allows for creating user-centered renovation and refreshment, which has been shown to have a positive impact on space utilization in commons areas of libraries.

This paper examines assessment aimed at measuring whether the user outcomes and preferences are achieving the goals and missions set for an experimental, ever-changing space.

Background/Description of Research Commons
The UW Libraries Research Commons is a 15,000 square foot renovated space located in the Suzzallo-Allen Library, the largest of the 13 libraries on the UW Seattle campus. The brightly colored space is designed for flexibility and collaboration, featuring movable furniture; large screens for sharing; and whiteboard tables, panels, and wall surfaces. Booths, alcoves, and semi-private rooms can be reserved by university students, faculty and staff. Technology tools offered to support collaboration include projectors, microphones, and whiteboard markers. The development of the Research Commons addresses the libraries’ goal of responding to the transition away from solitary, print-based scholarship and toward collaborative sharing of ideas in a public space. It also reflects the desire to create spaces that support the needs of students and faculty whose coursework and research are increasingly in digital form. Finally, it reflects the growing trend of creating flexible library spaces that mirror the future workspaces of students and support their work through all stages of the research process.

Positioned within the Reference and Research Services Division of the libraries, the Research Commons was initially staffed with one three-quarter-time librarian and one part-time graduate student, with operational support provided by the division’s manager of operations. Staffing has increased and now includes two full-time librarians, four part-time graduate students, and seven undergraduate students. The Research Commons was designed with a single service point, a help desk staffed initially by librarians, staff, and students from multiple library units.

Services include consultations and workshops provided by graduate student staff from the libraries and campus partner units. The Graduate Funding Information Service provides graduate students with one-on-one guidance and workshops on how to search for research funding opportunities. Research Commons graduate student staff also provide advising for students and faculty on citation management tools. Services provided by partners from outside the Research Commons include drop-in writing help provided by the Odegaard Writing and Research Center, and a design help desk, supported by the UW College of Engineering and UW Design Division. This service offers students, faculty, and staff assistance with data visualization, presentation design, and other visual work related to research and teaching.

While the space is designed to meet the needs of students regardless of level, services are primarily aimed at graduate students. Given data showing the decline in use of the physical library by graduate students, the UW Libraries had an interest in engaging with this population around their research needs in a library space. A strong partnership with the UW Graduate School aids in the development and promotion of these services.

Programs piloted by Research Commons staff are designed to encourage cross-disciplinary sharing of research. Two of the best examples of this are:

- **Scholars’ Studio**, a quarterly series where graduate students from across the university gather and present their research in five-minute lightning talks. Each quarter a theme is chosen that will speak to students in humanities, social sciences, and sciences. Graduate students doing research on that theme are invited to present, through a call for proposals. Students are selected to present at each quarter’s event, which is attended by an interdisciplinary audience of faculty, staff, and students. Guidance is provided to students on how to effectively present their work to those outside their discipline and how to craft a presentation using a template with slides timed to auto-advance. At each Scholars’ Studio, a librarian is also selected to present a five-minute opening talk on how the theme relates to library collections, services, and/or resources. Past themes include “Predictions,” “Robot,” “Disaster,” and “Water.” This series is cohosted by the UW Graduate School.

- **Collaborating with Strangers (CoLAB)**, a quarterly series of two-hour workshops where students, faculty, and staff engage in three-minute speed meetings to share their
Ray and Macy

current research interests and assets. Created by Bess de Farber, libraries grants manager at the University of Florida, the CoLAB Planning Series® inspires potential research partnerships across disciplines and helps participants build confidence in speaking about their own work. Attendees fill out a paper profile, enabling them to quickly share their research projects, skills, and networks with others. A post-workshop website is created to encourage participant follow-up with their new connections. In 2013, the Research Commons librarian applied for funding to bring de Farber to the UW campus for a three-day training, in which a group of subject liaison librarians learned about the CoLAB process and the facilitation of workshops. In the 2013–2014 academic year, we held three interdisciplinary Collaborating with Strangers workshops in the Research Commons. Subject librarians facilitate and participate in the workshops, offering an example of nontraditional librarian engagement with students and faculty.

Evolution of Research Commons Assessment
The UW Libraries have a strong culture of assessment. The libraries’ organizational structure includes a director of assessment and planning, a libraries assessment and metrics team, and a half-time assessment coordinator. Since 1992, the libraries have conducted a large-scale Triennial Survey of students and faculty regarding use, preference, satisfaction, and importance of library services and resources as a whole. In 2002, the libraries began distributing a second user survey, the In Libraries Use Survey, also on a three-year cycle. This survey is given to users entering every library location on campus during sample times, asking questions about use of physical spaces in the library. These surveys help the libraries prioritize services, improve spaces, reallocate budgets, and inform the overall strategic planning process.

After opening in 2010, the Research Commons librarian, in consultation with the director of assessment and planning, began setting yearly goals and activities for assessment of the space, services, and programs. These activities include involvement in the large-scale surveys mentioned above, as well as short-term assessment projects focused on pertinent questions surrounding Research Commons staffing, services, and space.

In the first year of operations, assessment efforts focused on collecting data that could show how the space was being used, what the space enabled, and what users valued about it. We conducted discussion groups with student users of the space, asking questions about what the space helped them accomplish, what types of furniture and technology met their needs, and what barriers prevent using the space effectively. From these conversations, we learned that students sought out the Research Commons for group work and felt strongly that any changes or improvements should serve to enhance flexibility and collaboration. Students identified areas they felt could be improved to better facilitate group work, and many called out improvements they felt were needed in our online room reservation system. In 2011, our fourth In Libraries Use Survey provided basic demographic and preference data on how users of the Research Commons differed from users of other library spaces on campus. The key takeaways were that users stayed longer than in other libraries’ spaces, they were predominantly undergraduates, and they wanted more of the same furniture and technology being offered.

Also in 2011, when we received new funding to renovate a space that had been left fallow from the original renovation, we quickly pulled together students, faculty, and staff from partner units for a design charrette. During this workshop, the Research Commons librarian shared existing data on use of the space and led a series of activities with the group. These activities helped clarify user priorities for student and faculty use of the space and brainstormed potential design solutions that would best meet their needs. From this exercise we learned that there was a clear need for larger reservable spaces for group work and graduate student presentations, as well as a need for space that more clearly centralized services within the Research Commons.

A year after opening, it was also clear that there was a need for more operational support in the space, and that we needed to reexamine whether our staffing model was best meeting users’ needs. At the time, librarians, professional, and student staff members from multiple library units each staffed the desk for no more than 1–2 hours per week. This made it challenging to ensure that everyone was kept up-to-date about policies and equipment specific to the changing space. The Research Commons librarian was frequently pulled
away from her work to provide operational support. In 2012, we sampled staff-patron transactions at the help desk and found that the large majority fell into three categories: circulation, assistance with directional questions, and questions about technology and equipment specific to the space. Only 3% of questions were considered by staff to be reference or research-oriented.

In 2012, we also began collecting evaluative feedback on a series of workshops hosted in collaboration with the UW Graduate School on topics ranging from citation management to academic networking. Feedback was overwhelmingly positive and showed us that the content we were providing was relevant to graduate student needs, but attendance at these workshops was low. To gain insight on how to better meet graduate student needs, we conducted a series of short, semi-structured interviews with graduate student users of the Research Commons, designed to solicit ideas for programming and service delivery for the 2012–2013 academic year. We learned that graduate students were looking for opportunities to connect with their peers, had a strong interest in building presentation skills, and that international graduate students desired programs tailored to their specific needs.

The libraries conducted the eighth Triennial Survey in 2013, which was sent via e-mail to all graduate students and a representative sample of 5,000 undergraduate students. The question, “During this academic year have you visited the Research Commons?” was added to this survey. We received a 19% response rate (2,127 surveys returned) from graduate students and a 21% response rate (1,044 surveys returned) from undergraduates. Thirty-nine percent of graduate and 48.2% of undergraduate student respondents indicated that they have visited the Research Commons, with undergraduate students in their third and fourth years indicating more visits than those in their first two years. Students from across all disciplines were represented in the “visited” responses, with the exception of business and health sciences, programs that are unique in that they have libraries with significant space and services. Additionally, results showed that graduate students who indicated having visited the Research Commons rated importance of and satisfaction with the libraries’ physical spaces/facilities higher than those who did not indicate visiting. When asked about services that would be most useful to their work, graduate students, as a whole, rated highest support for citation management, publishing, and data management.

How Assessment is Used
Assessment has allowed us to do a number of important things: make the case for growth, quickly keep the space and programming relevant to user needs, share lessons learned with libraries undertaking similar space renovations, and stop doing things that do not work or do not support our goals and mission.

Assessment data was used to write grants to support new technology and furniture in the Research Commons. For instance, the UW Student Technology Fee (STF) Committee, which oversees the expenditure of fees collected as part of student tuition, has fully funded two grants providing collaborative technology including screens, projection, and sound systems in reservable spaces. In 2013, we used data from the surveys and room reservation system in our STF funding proposal, to make the case that the space is utilized and highly visible across campus.

Our 2012 evaluation of transactions at the help desk provided evidence that a new staffing model was needed in order to better utilize the expertise and time of existing staff. Results from the assessment of help desk transactions were included in a successfully funded proposal for a small team of student staff that would work this desk exclusively, supporting the specific functions of the space. This student team receives intensive training on Research Commons policies and procedures and is able to provide operational support that greatly aids our programs and space. This decision made better use of librarian and professional staff time and ensured that the questions being asked at the desk were answered by someone deeply familiar with the technology, policies, and services of the space.

Most importantly, assessment has allowed us to make data-driven decisions about changing programs, space, and services to stay true to user needs. The open floor plan and movable furniture have allowed staff to make yearly changes to the layout, based on usage data and feedback collected from the In Libraries Use Survey. Information shared during our discussion groups and design charrette helped us make quick changes to
the space when short-term funding was made available. For instance, we used results of the 2011 charrette to create a large reservable seminar room configurable for presentations, workshops, or large group meetings. We also created a Consultation Studio that co-located our research support services into one space. Each of these spaces was constructed with glass walls and flexible furniture that can allow us to make changes down the road.

We have also used assessment to inform other libraries within our system. Libraries on our UW Tacoma and UW Bothell campuses have each implemented graduate student lightning talk programs based on the Scholars’ Studio series. Being able to share evaluative data from this program has been useful in shaping the success of these programs across the system. In addition, the space has attracted the attention of librarians at other institutions who are investing in renovations of a similar scope. Evaluative data has helped us communicate what is working well, so other libraries can plan programs and spaces shown to bring results.

Finally, assessment has informed our decisions regarding programs and services that should be discontinued. In the first two years of operation, we offered a drop-in workshop series for graduate students on topics such as citation management, time management, and writing literature reviews. Attendance at these workshops declined, despite the fact that the libraries and graduate school increased the promotion of these workshops on campus and that student feedback indicated we were offering content that graduate students wanted. Given the amount of staff time involved in planning and executing this series, we decided to move to an appointment-based consultation model. We piloted our citation management help service, provided by Research Commons graduate student staff on an appointment basis. Users of this service were surveyed post-consultation to determine if expectations were met and satisfaction achieved. This data informed the continued development of the service, as well as training materials for future staff. Most recently, we began looking at how to collect and use data from these services for more consistent evaluation and service improvement.

The 360-Review
The Research Commons was swimming in data by the end of the 2012–2013 academic year. We recognized that there were a number of data sources that could potentially reveal information about space use, user preferences for services, and how well we were communicating to target audiences about our programs. This included gate counts, headcounts taken at sample times, data from our room reservation systems, social media, and website analytics. It also included data that measured the effectiveness of online campaigns, such as the click-through rates for Research Commons content in the graduate school’s e-mail newsletter, which reaches all graduate and professional students at the university. While we had reviewed results of our assessment activities, such as survey data and workshop feedback, in order to inform yearly changes to the space and program, we had data from multiple sources that had not yet been examined.

In the iterative spirit of the Research Commons, we planned a “360° Review” with library staff, pulling together trends and highlights from multiple data sources for a collective brainstorm. Our goals with these reviews were to look broadly at the data we had been collecting, take stock of assessment efforts, and create a more sustainable assessment plan for the upcoming academic year. While the process was not scientific, it gave us a chance to reflect on what we had gathered, look for trends, and prioritize assessment efforts. Gathering data from the assessment activities and data mentioned above, we printed graphs and charts that would best illustrate highlights from the data, along with printed samples from qualitative feedback (e.g., survey comments, notes from discussion groups, observations) and photos of the space. These documents were posted on the walls around a large meeting room. Staff circled the room and used whiteboard markers and sticky notes to write down what they felt the data revealed, what questions the data raised, and who might be interested in the data beyond Research Commons staff.

This exercise allowed us to see connections between data and reveal questions we had not considered previously regarding our users, space, and services. It allowed us to corroborate results from multiple assessment projects and data sources, revealing a richer picture of user needs and preferences. It also enabled us to determine what information we were not capturing. Key themes in the data showed:

• Satisfaction with our space is high. Users want more of the same kinds of furniture and
technology and prefer spaces that offer more visual privacy.
• We have a clear picture of graduate student preferences for service content and delivery but do not understand whether our efforts at marketing services and programs are effective.
• Students from across departments utilize the Research Commons space, but we do not know how and whether we were enabling cross-disciplinary connection.

This final point revealed something big about our previous assessment efforts. While we were successful at creating a flexible, user-centered space, our assessment efforts weren’t helping us account for our mission to foster interdisciplinary collaboration.

Focus on Interdisciplinary Outcomes
As the Research Commons entered its fourth year of operation, we decided to focus assessment efforts on better understanding the experiences of users who had participated in our programs designed to foster interdisciplinary collaboration and connection.

In the past, assessment of Scholars’ Studio had been limited to a short post-event evaluation form given to attendees, and a brief roundtable discussion with graduate student presenters. While these methods were effective in learning what logistically went well about the event, it did not enable understanding of the outcomes for students chosen to present. In order to gain understanding of the presenter’s experience at the event and its potential impact on their research, we conducted interviews with presenters from past Scholars’ Studios. Interviews were conducted in winter and spring of 2014, lasting 10–20 minutes in length and occurring 3 to 12 months after the event. Interviewers were guided by a script in order to create a consistent interview experience. The questions delved into the student’s experience of Scholars’ Studio, the program’s impact on presenters creating new connections, the effect it had on their research, and gathered further information on how the Research Commons and graduate school can continue to support students.

Questions included:
• Why did they choose to submit a proposal?
• What was their experience of Scholars’ Studio? What was valuable? What was challenging?
• How do they currently make connections with colleagues in other disciplines?
• Did Scholars’ Studio improve their ability to present and communicate their research?
• Did the experience of presenting, and seeing other presentations, introduce new ideas or make them think about their own research differently?
• How can we better facilitate cross-disciplinary connection during and after Scholars’ Studio?

Overall, participants of Scholars’ Studio found it to be a valuable experience. For many, it forced out-of-the-box thinking as they developed their presentations to fit within the constraints of timed slides. Most admitted that the timed component was by far the most challenging aspect, followed by determining content to fit the interdisciplinary audience. The presentations at Scholars’ Studio did help some of the students rethink their own research as they considered how different disciplines may approach similar research questions.

Others expressed that the theme was very broad and that the other presentations were too different to apply to their research. Disciplinary barriers between sciences, social sciences, and humanities made finding connections difficult. One student suggested that perhaps there should be some sort of cohesive discussion or ending to tie all the talks together. Another student reflected that during the Q&A having the same question posed to each of the speakers allowed him to consider different viewpoints across disciplines.

Quotes from Scholar’s Studio Interview
Project Participants:
I think that it also changed the way I classically thought about my own work. I just do work on race or social groups, but actually that spans a lot of different topics so it was really eye opening in that realm.
(PhD Student, Social Sciences)

It did introduce me to the full scope of that area, which I can see being helpful just in conversation.
(PhD Student, Medicine)

In terms of the communication of my research, having that structure where the slides were 20 seconds was really helpful because it made you really condense the
The interview also provided the opportunity to solicit feedback on how the Research Commons can continue to support graduate students.

I think it would be some more advice—I didn’t have problems with the slide show, and I think that it was very successful in terms of not having too many images. I think I was solid with the text, but for me I was trying to learn ways in order to use a slide efficiently while speaking. (PhD Student, Humanities)

Feedback from the interviews allowed us to make adjustments in the execution of the following quarters’ Scholars’ Studio events. Based on the responses we received through surveys and additional interviews those changes proved to be positive.

We also examined participant outcomes from the Collaborating with Strangers workshop series, also designed to encourage cross-disciplinary sharing of research. Librarians who received training on the CoLAB process chose interdisciplinary themes that would speak to students in the disciplines they support, and worked with the Research Commons librarian to plan and promote three workshops held in the space in the 2013–2014 academic year. Each workshop had an average of 27 participants, with a combination of undergraduates, graduate students, faculty, and staff represented at each.

During the fall quarter we held “Collaborating with Strangers on GIS Research” as part of the UW GIS (Geographic Information Systems) Day program. During the winter quarter we partnered with the UW Simpson Center for the Humanities and UW Information Technology to plan a workshop geared towards students and faculty engaged in digital humanities and related research. During the spring quarter, we held “Collaborating with Strangers on Food Research,” working with partners in campus dining services, the university supported community farm, and the Student Food Co-Op to plan and promote the event.

Participants filled out a seven question survey at the conclusion of the CoLAB workshops, which asked about workshop satisfaction as well as how strongly they agreed that the workshop helped them articulate skills, talk about their research, and connect with people in other disciplines (Figure 1).
Overall, evaluations have been very positive, with 96% of all Research Commons CoLAB workshop participants indicating that they would “attend a similar workshop in the future.” Results were shared with the planning team and provided a way for us to understand participants’ experiences. As a next step we would like to do a post-event follow-up to explore whether participation in these workshops had an impact on participants’ research and learning.

**Conclusion**

The renovation of the Research Commons into a modern, collaborative, talk-out-loud space that housed no print collections and looked quite different from the rest of the building signaled that something new was happening in the UW Libraries. The renovation accomplished our goal of providing a flexible space designed for collaboration. Equally important, the newness and “designed for change” visage of the space provided a visual illustration of a philosophy that we applied to our services, programs, and assessment. The creation of the Research Commons gave us an opportunity to explain to members of our community that we wanted to engage with them in new and different ways through programs like Scholars’ Studio and CoLAB. It also enabled us to test new programs and a philosophy of iterative change that might have seemed out of place in more traditional library spaces.

During visitor tours of the Research Commons, it is not uncommon hear the question, “Why is this space in a library?” Indeed, as libraries move towards space renovations that increasingly leave out the elements that used to define us (e.g., physical collections, a reference desk), we must dig deep when considering how exactly we are engaging with our users and supporting their research process in these spaces. In addition to evaluating the success of these spaces by looking at user satisfaction, we must consider how we are measuring engagement with piloted services and programs, and how those services and programs are affected by the space. As Elliot Felix pointed out at the 2012 Library Assessment Conference, library services and spaces are generally designed separately, which hampers user-centered assessment, design, and the effective support of learning and research. In testing and evaluating new programs like Scholars’ Studio and CoLAB in our space, we hope to create a more holistic approach to assessment. Libraries are putting an increased emphasis on librarian engagement within the scholarly community, as well as on understanding the changing needs and practices of students, faculty, and staff. At the same time, we need new models for serving our community in...
library spaces that go beyond transactional help at a desk. What can we learn about these programs that could help us in developing new models of service?

Evaluating a newly renovated space that is designed to allow constant evolution and change has been a work in progress. For staff leading these efforts, it has reaffirmed the importance of having an established library assessment program in place. Data from the large-scale surveys conducted by the libraries as a whole provided us with reliable data on user demographics, space preferences, and graduate student priorities for research support. These surveys and local staff assessment expertise provided a baseline of information that helped us make informed decisions, while also freeing us to focus on more iterative assessment projects. In addition, the support of library administration for a “freedom to fail” vision of ongoing experimentation and change afforded us the organizational support necessary to test and evaluate new programs.

Finally, our assessment of programs designed to foster interdisciplinary connections have allowed us to identify how we might strengthen these programs to best meet students’ needs. At the same time, it has revealed how much more we have to understand about how cross-disciplinary research works, and how we might best support it. How do students and faculty make connections that will impact their research? And what are the outcomes for librarians who participate in these programs? There is more work to do to examine these questions and new program models to come.

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Notes


8. Survey Forms and Results for the University of Washington Libraries Triennial Survey and In Library Use Survey can be found here: http://www.lib.washington.edu/assessment/.

9. This survey was designed by David Miller, PhD, director of the Collaborative Assessment and Program Evaluation Services at the University of Florida. More information can be found here: Bess de Farber, “Initial Steps to Create the CoLAB Planning Series®: workshops designed to spark collaborations and creativity through revealing and leveraging community assets,” 2013, http://ufdc.ufl.edu/IR00003505/00002.


E-Book Reading Patterns of Faculty

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ABSTRACT

Purpose: With the advent and increasing adaptation of e-readers and tablets, e-books are an increasingly important part of a library collection. This study examines how and if faculty are using e-books in their academic work.

Design: A questionnaire was distributed throughout 2012 and 2013 to faculty at five universities in the United States and four universities in Australia. The questions were based on critical incident theory, in which the last reading is presumed to be typical of the respondent's reading behavior. Questions included how many books read in the last month, time spent per reading, how the respondent became aware of the reading, where it was obtained, whether it was print or electronic, the principal purpose of reading, and how important the reading was to the principal purpose. We did not ask whether the book was read on a computer or mobile screen, and this question should be considered in future surveys.

Findings: In many cases, faculty use of e-books did not greatly differ from print book reading habits. Principal purposes of reading and time spent becoming aware of book readings did not greatly differ between print and e-books. However, there were some noted differences. Respondents spent more time reading print books than e-books. They read from this same book on more occasions if it was a print monograph. But, many more respondents reading from an e-book stated that they would not bother getting this source if the source was not available than respondents reading from print books. Although many users were adamant in their preference for print books in the comments section of our questionnaire, they are using e-books. Furthermore, although a few of the participating universities in Australia had an e-preference policy, we did not discover a great difference in percentages of e-books used in comparison to the United States.

Value: This study demonstrates the value of an e-book collection to academic patrons, regardless of their faculty status. It also shows that as the academic population becomes more familiar with this format, they recognize its value to their work. We predict that e-book use and value will only increase with the wider adaptation of e-readers and tablets in the academic environment and as more academic works become available in e-formats.

INTRODUCTION

With the advent and increasing adoption of e-readers and tablets, e-books are becoming an ever more important part of library collections. This study examines how and if faculty are using e-books in their academic work. This particular presentation is taken from a larger examination of scholarly reading habits and use patterns in the United States and Australia for the Lib-Value Project (Value, Outcomes, and Return on Investment of Academic Libraries).

An online survey was distributed at five universities in the United States and four universities in Australia in 2012 and 2013. We had 358 total respondents for Australia, with response rates ranging from 1% to 18%. In the United States, we had 837 respondents, with response rates ranging from 4% to 19%. Because respondents were allowed to skip any question or leave the survey at any time, most of the questions had a lower number of responses. All respondents for a particular question equal 100% for that question.

Survey questions focused on faculty scholarly articles, books, other publications, and social
media reading patterns, though we present only the e-book reading pattern results. The survey questions were developed based on the critical incident of last reading, in which the last reading reported is considered representative of normal reading habits.1

RESULTS
On average, faculty in the United States (M=6.80) and Australia (M=6.95) reported reading seven book readings per month or approximately 84 readings per year. However, Australian faculty reported a higher percentage of e-book readings. Nearly 16% of the Australian book readings were from e-books compared to just 8.4% of those by United States faculty. Although, it must be noted that the Australian universities surveyed had an e-preferred collection development policy.

We asked respondents how they became aware of their last book reading. For Australian respondents, finding book readings through another person (41%), searching (25%), and through a citation (21%) were the most common methods of discovery. For United States respondents, discovery methods were somewhat similar. Another person (29%), searching (24%), and “other” methods (19%) were the most common methods for United States respondents. “Other” methods included e-mail, journal alerts, e-mail lists, and newsletters. These results were nearly the same for print book readings.

Time spent reading
United States faculty spent more time reading print books than e-books, while Australian faculty spent more time reading e-books. Faculty in the United States spent approximately 113 minutes per print book reading compared to just 84 minutes per e-book reading. On the other hand, Australian faculty spent approximately 184 minutes per e-book reading and 113 minutes per print book reading. However, the time spent reading for Australia is only a rough estimate as we were only able to gather that data for two of our four Australian universities due to a glitch in our survey software.

Source of reading
Half of all Australian faculty e-book readings were obtained through the library (including interlibrary loan), but only 14% of the readings by United States faculty were obtained through the library. The most common source of e-book readings in the United States were “other” sources, which include: previously owned material, Amazon, Google Books, and free web copies. In the United States, e-book readings were more often purchased than obtained through the library. This trend mirrored the overall United States faculty book readings. United States faculty were also more likely to obtain print book readings through purchases (41% versus library 27%). On the other hand, the library and purchases were about even (one-third apiece) for Australian print book readings.

People using e-books were less likely to look elsewhere if the source was not available. For respondents who would obtain e-book reading elsewhere, we did not ask them where they would obtain the reading. The difference was significant for United States faculty ($\chi^2=6.772, p=.009$), but not for Australian faculty ($\chi^2=2.942, p=.086$). However, if we look at e-books obtained through the library, we see that most e-books would be obtained elsewhere if not available through the library. Eighty-one percent of Australian e-book readings obtained through the library would be obtained elsewhere. All e-book readings by United States faculty would be obtained elsewhere.

Importance of Readings
E-book readings from both countries reflected the same top three outcomes of reading. Respondents said that the e-book reading “improved the result,” “changed or narrowed the focus of their research,” and “inspired new ideas.” Print book reading outcomes were the same, regardless of country.

Print book readings were considered more important than e-book readings in both the United States and Australia. Fifty-nine percent of Australian print book readings and 60% of United States print readings were considered “absolutely essential” or “very important.” E-book readings, however, ranging from “absolutely essential” to “important” held steady at 38–41% for both countries. In any case, there was no significant difference between countries in the importance of book readings.

Print book readings are more likely to be cited in both Australia and the United States. Over half of the print readings by Australian faculty and 49% by United States faculty have been or will be cited, whereas only 47% of Australian e-book readings
and 31% of United States readings will be cited. E-book readings from the library were more likely to be cited than purchased e-books. In the United States, 17% of e-book readings obtained through the library and 11% of purchased e-books will be or have been cited. In Australia, 45% of library e-books and one-third of purchased e-books have been or will be cited.

Demographics
In our analysis, gender, age, and rank (position) were not statistically significant. Although respondent age is not statistically significant, the trend is that print has a higher average age of respondents than e-books. For print book readings, both United States and Australian respondent age average is 49 years. For e-books readings, the average age of Australian respondents was 30 years, while it is 40 years for United States respondents.

Engineering/technology/math respondents had the highest percentage of e-book readings in the United States (23%), while those same disciplines had among the lowest percentage for Australia (9%). Social science faculty had the highest percentage for Australia at 21%. Humanities had the lowest percentage of e-book readings for the United States at just 3%.

Teaching and research are the two most important types of duties for faculty respondents. Of those who use e-books, Australian faculty spent a higher percentage of their time teaching (30.2%) and research/writing (41.5%) than United States faculty (23.8% in teaching and 30.9% in research/writing). United States faculty spent more time consulting/advising (16%), in service (14.6%), and in other duties (7.3%). Australian faculty using e-books spent 7.8% of their time consulting, 7% in service, and less than 1% in other duties. Time spent on administration was equal for both countries and for those reading e-books. This trend was also reflected in their principal purpose for book reading in general. Research (59.4% for Australia and 47.6% for United States) and teaching (18.8% for Australia and 21.4% for the United States) are also the principal purposes for reading print books and e-books in both countries.

CONCLUSION
E-book reading behavior often mirrored the reading behavior of respondents reading print books in terms of how respondents became aware of, obtained, and used e-book readings—regardless of their country of origin. We expect e-book use and value will only increase with the adoption of e-readers and tablets in academia.

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REFERENCES
Three E-book Outlooks: What Humanists, Social Scientists and Scientists Want and Predict (A LibValue Study)

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Abstract
A multi-disciplinary e-book survey was conducted at the University of Illinois at Urbana-Champaign (UIUC) between 2013 and 2014 to determine how humanities, social science, and science scholars viewed the current and future use of e-books in their field. Participants were also asked to follow a link to use an e-book in their discipline on the e-brary platform and to report their experiences. Survey questions included an evaluation of present experiences and level of use, the value associated with e-books, and predictions of what their discipline's e-book future will look like in the next five years. This study, supported by a grant from the Institute of Museum and Library Services (via “LibValue,” http://libvalue.org/) began with a humanities DDA (Demand-Driven Acquisitions) program, continued by surveying humanities scholars, and grew over time to encompass the three disciplines as questions arose concerning how a diverse spectrum of scholars adopted e-books or planned to migrate to the e-book format. The data from these studies were used to inform library subject selectors concerning collection trends observed and predicted by their clientele. One result was the purchase of high-use DDA e-books that demonstrated the use and value these scholars found from this book format.

Introduction
The LibValue Study at UIUC was focused on e-book use and value; over time, and through separate but thematically-connected research projects, the grant-funded studies included a series of surveys that looked at e-book perceptions and use by discipline. The initial ROI/value research at UIUC can be traced to 2006, when the UIUC Library volunteered to work with Elsevier to attempt to determine a Return on Investment (ROI) for the academic library. Judy Luther, the study's lead author, concluded, “Using the ROI model with UIUC data produced a return of $4.38 in grant income for every dollar invested in the library in 2006.” While the ROI studies turned international after this study, UIUC joined the LibValue IMLS grant in 2010 and began to focus on e-book use and how this format was received and perceived by the library, librarians, and library users. Chrzastowski worked again with Elsevier to determine how UIUC scientists value e-books through a log-book study and survey; this research also had a local component which looked at e-book acquisition, cost, use, and cost/use ratios. These studies found that e-books can be a valuable format for both libraries and users, and that e-books can be a “win-win” for both parties; however, any migration to a 100% e-book library seems unlikely and would not wholly serve either party in this partnership.

A broader approach to studying e-book value and adoption began in spring of 2013 with a mixed methodology study of e-book use by humanists. A DDA study was combined with an online survey of seven subject areas in humanities at UIUC: art, art history, architecture, classics, music, history, and religion/theology. This study led to a replication of the same two methodologies (DDA and online survey) in the social sciences, followed by repeating the online survey in the sciences. Because UIUC
had already invested heavily in e-books for the sciences, a DDA program was not practical in that discipline. The combined purpose of these studies was to discover the attitudes and preferences that scholars from different disciplines have concerning the e-book format compared to print. Due to the time limits of this presentation, only the survey results from the three disciplines will be discussed; the authors plan to publish the DDA results and the more extensive survey results in the near future.

Research Questions
Two specific questions motivated this research. The first question concerned e-book adoption. What is holding up e-book adoption in non-science fields? This question is similar to the chicken/egg quandary. Are humanists, for example, not using e-books because they do not like them, or because they are not available for them to use? Are librarians not buying e-books in some fields, thinking their clientele does not like e-books? Or are publishers not making e-books available in some disciplines for similar reasons? Are note taking and copyright issues totally deferring humanities scholars from e-book adoption? Are any of these assumptions based on facts? This question leads to the second motivation, the need to understand if different disciplines are really that different when it comes to e-books. Other, tangential questions were also posed, and many were also answered by the DDA program that accompanied two of the disciplinary research projects. The scope of this paper (accompanying a 10 minute lightning session), represents only a superficial look at one part of the study and its findings.

Survey Methodology
The basic methodology for the online survey portion of this study can be outlined by these main points:
• Design and create the survey (SurveyMonkey)
• Incorporate several methods: Likert scale, open ended questions
• Gain IRB approval
• Invite survey participants through departmental emails and assure anonymity
• Provide incentives
• Lead respondents through an e-book use (that matches their discipline)
• Analyze quantitative results; code qualitative responses to allow for analysis

Table 1. Table 1 shows the departments included in the studies by discipline. A spectrum of departments within a discipline was selected to provide a broad variety.

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<thead>
<tr>
<th>Humanities Departments</th>
<th>Social Science Departments</th>
<th>Science Departments</th>
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<td>Architecture</td>
<td>Anthropology</td>
<td>Chemistry</td>
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<td>Art</td>
<td>Educational Psychology</td>
<td>Computer Science</td>
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<td>Educational Policy</td>
<td>Materials Science</td>
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<td>Library Science</td>
<td>Molecular &amp; Cellular Biology</td>
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<td>Religion /Theology</td>
<td>Social Work</td>
<td>Sociology</td>
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The return rates for each survey varied; each survey was open for one month, although the science survey was extended by one week due to spring break. The humanities survey (April 1–March 31, 2013) had a return rate of 14.4%; the social science survey (November 4–November 30, 2013) had a 24.8% return rate; the science survey (February 17–March 20, 2014) had a 14.93% return rate. A total of 594 faculty and graduate students from 21 departments responded to the surveys. All three surveys were identical except for the links to use e-books on the e-brary platform and a question concerning familiar publishers that was subject-specific. The survey collected...
demographic information and then used those data (departmental identification) to select three e-book options to choose from in the respondent’s department/discipline. Part of the survey was to use an e-book and to answer follow-up questions on that experience. The humanities survey offered e-books from both e-brary and ACLS; the other two surveys used only e-brary.

The entire survey (for the humanities; subsequent surveys were based on this original with only slight change for discipline differences) is found at IDEALS, the UIUC depository: http://hdl.handle.net/2142/45708.

Results

Demographic and baseline questions led the survey. The vast majority of all respondents said they had used an e-book before and had no problems using the e-book via e-brary as part of the survey. There is very little difference between disciplines concerning the baseline use of e-books.

A series of questions were asked concerning value, how to improve the e-book experience, and the all-important “tipping point” questions. When asked about the value of e-books (“Which statements below most closely reflect your opinions about the VALUE of e-books? Select as many as apply.”), all three disciplines valued accessibility over all other options. As seen in other results, accessibility seems to be the tipping point for all scholars who, we know, all need that book (article, patent, etc.) NOW, or yesterday. E-books offer that accessibility combined with a greater availability, since multiple-user licenses are often available. Figure 1 shows that although the percentages differ, all disciplines chose the more positive statements over the negative. As expected, the humanities and social science scholars took more issue with note taking and slightly more issue with technological issues.

Figure 1. “Which statements below most closely reflect your opinions about the VALUE of e-books? Select as many as apply.” Results shown in percentage.

![Figure 1](image)

Figure 2 shows the results from the question, “What do you feel would make e-book usage more suitable for use in your area of study? Select all that apply.” Over 75% of the humanities scholars supported the option, “More titles available in my subject area.” It is clear that the barrier to e-books for humanists is title availability, and current title (60.6%), availability. The other disciplines also felt strongly about both more and more current e-book titles becoming available, and all three disciplines
recognize and bemoan the restrictions on copying, printing, and copyright image reproduction. There are clearly more similarities here than differences. Less important, again to all three disciplines, are e-book media capabilities, instruction, and training. PDA (DDA) accessibility is also not important to these scholars, although it is unlikely that many see DDA programs taking place behind the scenes. This terminology (PDA/DDA) was used because the survey did follow a DDA program in the humanities and social sciences, by promoting it and exposing those scholars to this collection development strategy.

**Figure 2.** What do you feel would make e-book usage more suitable for use in your area of study? Select all that apply. Results shown in percentage.

Figures 3 and 4 show the results for two of the most obvious “tipping point” questions in the survey. First, Figure 3 asks, “What is your “tipping point” or the strongest reason for selecting a book’s format? Choose all that apply.” The majority in each discipline chose either accessibility or availability, followed by portability. Note taking is least important to scientists, but of nearly equal and greater importance to humanists and social scientists. While very few chose “other” and specified another reason, most of those replies focused on the immediate needs of scholars. They were happy to use whichever format was immediately available to them. More humanists commented about actual readers or tablets; this discipline seems slightly behind the other two in terms of technology and devices at hand.

The second “tipping point” question is shown in Figure 4, “If a print book is unavailable (charged out or not owned), and the e-book is available, I would:” This question directly asks format preference, and garners similar results to those shown in Figure 3. By very large margins for all disciplines, the availability and accessibility of an e-book trumps the need for a print book. Approximately 28% of humanists would look into getting the book through interlibrary loan, followed by 18% of social scientists, and 7% of scientists. The option of buying a personal copy was not selected by any humanities or social sciences scholars, and by only 1.5% of scientists. Clearly these respondents feel it is the library’s responsibility to provide their research materials; but they are more than willing to accept e-books if that format is accessible and available.
Figure 3. “What is your “tipping point” or the strongest reason for selecting a book’s format? Choose all that apply. Results shown in percentage.

Figure 4. “If a print book is unavailable (charged out or not owned), and the e-book is available, I would:” Results shown in percentage.
Conclusions and Predictions
To gauge how scholars see their disciplines’ migration to e-formats, Figure 5 represents the results from the question, “Where do you see the future of [your field] e-books moving in the next five years?”

Figure 5. Scholars’ predictions for e-book use in their discipline over the next five years. Results shown in percentage.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>I don’t like ebooks and I hope I don’t have to use them in the future</th>
<th>In 2019 I will still expect print for over 50% of my book use</th>
<th>More than 50% of my book use will be in ebook format by 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities</td>
<td>20%</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>20%</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>Sciences</td>
<td>20%</td>
<td>60%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Scholars in both the social sciences (55%) and sciences (67%) predict that in five years over 50% of their monographic research will be in e-book format; humanities scholars are divided on this issue (46% predict print predominance, 44% predict e-book predominance). The humanities seem nearly ready to tip over toward e-book acceptance, migration, and dominance, but not quite yet, and with good reason. Their discipline often relies heavily on the reproduction of copyrighted works, creating issues in using these works online. There are technical problems with note taking and fewer grants available to make technology (tablets, readers) readily available. But these are issues that can be solved, and many of the humanists in this study see that these solutions are not only possible, but probable. Of much greater concern is the possibility that they do not believe their libraries will make this technological leap with them, perpetuating the chicken/egg quandary. Some follow up research in focus groups with humanists will be needed to further determine reasons for their hesitation.

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4. Ibid.
Academic Libraries’ Support for Teaching: A LibValue Project

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Abstract
This lightning talk presented findings from two surveys of instructors—conducted at the Universities of Tennessee and North Carolina, Wilmington—and instructor focus groups conducted at the University of Tennessee. Although a significant body of assessment-related research has explored academic libraries’ support for faculty research and student learning, instructors’ use of the library in support of their teaching responsibilities is less studied. This research investigated instructors’ use of the academic library’s physical space, collections (print and electronic), and services in support of their teaching.

Background
LibValue: Value, Outcomes, and Return on Investment of Academic Libraries was a three-year study funded by a grant from the Institute of Museum and Library Services. The object of the study was to define and measure the value of all areas of academic libraries. While members of the LibValue management team at various institutions considered many different ways of defining and measuring library value, the teaching and learning team at the University of Tennessee chose to look at a relatively unexplored area of academic library value: the value of the library in supporting teaching. Gaining a better understanding of how instructors make use of library resources and services in their teaching would provide much-needed guidance for planning and decision making related to allocation of resources, staffing, publicity, and other efforts, as well as support for demonstrating the library’s value to the university.

Surveys—Methodology
In order to assess the value of library resources and services to supporting the instructional mission of the university, the researchers targeted instructors at the University of Tennessee, Knoxville and the University of North Carolina, Wilmington. In late 2011 and early 2012, subjects were invited to participate via e-mail sent from the librarian of the university with an embedded link to the survey instrument. Faculty, instructors, and graduate teaching assistants at both universities were invited to participate in this study. Respondents were asked about the specific library resources and services used in support of teaching, and potential alternate sources of teaching support for those library resources and services not used. The surveys yielded responses from nearly 400 graduate teaching assistants, part-time-, and tenure-line faculty at the two institutions.

Surveys—Findings
Respondents at both institutions indicated that using resources, services, and facilities provided by their university’s library resulted in savings of time, money, and other resources. Additionally, they reported seeing evidence that using the library improved their teaching and the course-related materials they were able to access and pass on to their students. Students’ performance on written work was also improved as a result of instructors’ library use; specifically, instructors indicated that after participating in library instruction, their students cited more appropriate and varied material in their written work, and did so with a higher level of accuracy.

While respondents at both institutions indicated heavy (and increasing) reliance on their libraries’ electronic resources for course preparation and assigned readings, they were less likely to employ the libraries’ services in support of their teaching. The differences between the two institutions provided an interesting contrast: responses from
instructors at UNCW, a regional institution with the Carnegie Classification of “Master’s L: Master’s Colleges and Universities (larger programs)” indicated heavier usage of library resources and services than did respondents from the University of Tennessee, Knoxville, classified as “RU/VH: Research Universities (very high research activity).” This finding is especially interesting when considering that UTK Libraries’ holdings were recorded as 2,895,550 items for fiscal year 2013, while UNCW’s Randall Library holdings are 1,186,624. This may reflect differences in the two institutions’ missions.

An unexpected benefit cited heavily by respondents from both institutions was the reduction of paper clutter and waste facilitated by using library resources. Several respondents pointed to the environmental benefits of accessing material electronically.

At both institutions, the survey itself provided an opportunity for outreach and public relations. As is so often the case, simply conducting an assessment project informs respondents of services and resources of which they might not have been aware; several respondents indicated surprise at the breadth of support offered by the libraries at both UNCW and UTK.

Focus Groups—Methodology
While graduate teaching assistants and contingent faculty members’ teaching-related concerns and needs often differ significantly from those in tenure-line positions, instructors in these positions may have fewer opportunities to be heard. In order to further explore the library’s value for instructors outside the tenure system, LibValue team members followed up on the surveys by piloting focus groups with graduate teaching assistants and contingent (part-time or adjunct) faculty members. In these sessions, which were conducted in 2013 and 2014, participants were asked about their use of the library in support of their teaching and how the library’s services might be expanded to further assist them in this area. To identify participants, the researchers sent directed e-mails to academic departments on campus. While some potential respondents were unable to participate due to scheduling conflicts, three sessions were conducted with seven participants, who represented the Marketing and Supply Chain, Mathematics, Child and Family Studies, English, Film Studies, and Information Science departments at UTK. In an attempt to reduce potential response bias, the focus groups were held in the College of Communication and Information building and moderated by the member of the team who is not employed by the UTK Library. The sessions, which took place in a specially equipped focus group room, were audio recorded and observed via one-way glass. The recordings were transcribed and coded by the researchers to identify themes.

Focus Groups—Findings
While focus group participants indicated their use of the library in support of teaching was similar to tenure-line faculty behaviors in many ways, they did acknowledge some gaps in the teaching support the university provides to them, as well as ways in which the UTK Libraries might step in to fill those spaces.

Specifically, respondents relied heavily on the physical space of the library to conduct classes and study groups, meet with students, and for personal workspace. They utilize the library’s collection for current awareness purposes and to identify materials for their classes. In addition to seeking out content-related resources, they reported using library materials that related more directly to pedagogical issues. The focus groups revealed some interesting insights into respondents’ information behavior. While they indicated heavy use of the library’s print and electronic collections, they identify materials by consulting colleagues, blogs, bibliographies, subscription databases, and web search engines. They do not, as a rule, consult librarian liaisons.

Participants described their students as generally having very basic research skills and limited knowledge of the research process. However, confirming findings from previous studies such as the ITHAKA S + R Faculty Survey, focus group participants considered teaching their students information literacy skills to be their responsibility rather than something they would “outsource” to a librarian. Participants identified teaching students to avoid plagiarism and how to cite sources properly as important priorities.

As in the case of the surveys, the focus groups provided an opportunity to publicize the library’s resources and services designed to support teaching. At different points in the sessions,
several participants indicated surprise at a library resource or service that had been mentioned by the moderator or another participant. That assessment projects afford such opportunities is arguably as valuable as the data they collect.

**Discussion and Future Directions**

This study constitutes a first step in a potentially fruitful area of investigation. The surveys revealed that the library provides savings in time and money for instructors in support of their teaching, as well as supporting evidence that services, like library instruction, add value to students’ learning experience. The findings also suggested areas for further investigation, such as possible differences in usage and approach based on institutional mission. The focus groups revealed a group of users, adjunct and part-time faculty and GTAs, who are open and anxious for help with pedagogical issues. The library supports this group of users already with spaces, resources, and services, but the findings indicate areas where support might be expanded. Deploying the survey at more institutions in the future would make the data more robust and further clarify the current findings. Repeating the focus groups at other institutions would also increase clarity and further verify this study’s findings.

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**References**


The purpose of the Institute for Museum and Library Services (IMLS)-funded Value, Outcomes, and Return on Investment of Academic Libraries (LibValue) Project was to develop a suite of tools to help academic libraries demonstrate value and return on investment (ROI). During the grant period (2009–2013), several lines of research were gathered under the LibValue umbrella, and projects were conducted at colleges and universities in the United States, the United Kingdom, and Australia. Participating researchers from a variety of disciplines have published papers and articles, given presentations, and delivered webcasts that were subsequently posted on YouTube.

The scope of the project and the geographic distribution of its team members necessitated an organized plan for sharing documents and resources. Near the beginning of the project, a small sub-group of LibValue Project team members began considering how to construct a literature review on the topic of library value and return on investment to support the larger team’s research efforts. Considering the project’s scope and complexity, a standard literature review or annotated bibliography did not seem sufficiently functional. Instead, team members decided to create a bibliographic database to be housed on the project website. The functionality of such a tool would facilitate collecting existing research pertaining to the subjects being studied by the LibValue team, adding new research developed during the course of the project, and showcasing the research outputs of LibValue team members. In addition, a database could be browsed or searched by a number of fields. The Drupal content management system’s bibliography tool also allows users to export individual records, an added benefit. As the database was always intended to be accessible to interested parties not affiliated with LibValue, this was an added benefit.

Citations for the database were collected from published bibliographies, by searching library and information science (LIS)-specific resources like Library Literature and Information Science Full-Text as well as general interest databases like EbscoHOST’s Academic Search Premiere, and by referral from LibValue team members. Due to publisher copyright restrictions, abstracts were stripped from bibliographic records prior to uploading into the Drupal site. Megan Oakleaf’s Value of academic libraries: A comprehensive research review and report, published by the Association of Research Libraries in 2010, provided a trove of citations related to value and return on investment.¹ Records for the works cited in the Value report were located and added to the database in its first update.

Building a Controlled Vocabulary for the LibValue Bibliographic Database
Creating a digital bibliographic database with the purpose and functionality of the LibValue resource is a relatively new phenomenon, and the literature documenting the concerns and considerations inherent in such a task is not yet widespread. Similarly, while controlled vocabularies are widely used and many have been developed to suit the needs of a specific resource or body of research, literature describing the process of creating a subject-specific controlled vocabulary is not extensive. In recent literature, McKnight described the history of discussions about controlled vocabularies for music and the current opportunities for describing music with
the introduction of RDA. Bartol assessed the use of controlled vocabulary terms for retrieval of agricultural information in non-agricultural databases. Gómez and Cañadas described their method for creating a controlled vocabulary for Funes, the digital repository for the field of mathematics education, but emphasized that the Funes taxonomy is not a thesaurus, as it lacks the capability to link related terms.

Citations for the LibValue Database were created, edited, and organized using EndNote, then imported into the LibValue Drupal site’s bibliography module. Both EndNote and the Drupal module allow entries to be organized using author, title, year, and keyword, enabling both advanced search and discovery and browsing. Most citations selected for the bibliography were imported to EndNote directly from subscription databases or from Google Scholar. While convenient, this meant that keywords as assigned by the resource in question were imported into the database. Because the citations were imported from a variety of sources, the aggregated collection lacked a cohesive subject term thesaurus. This is a common issue as scholarly content becomes available through an ever-expanding array of proprietary platforms. In his assessment of controlled vocabulary in the agricultural scholarly literature, Bartol acknowledged this discrepancy, stating that “all thesauri contain agriculture-based headings; however, associative, hierarchical and synonymous relationships show important inter-database differences.”

By 2012, the bibliographic database had over 900 citations with more than 500 keywords, including general topics (instruction, value, impact, etc.), organizations or agencies (Association of Research Libraries, Institute of Museum and Library Science, etc.), methods (return on investment, contingent valuation, etc.) and functional areas (collections, information storage and retrieval, evaluation). Unfortunately, the keywords also included duplicates, misspellings, and synonyms. In an effort to improve the utility of the bibliographic database, it was decided to apply a measure of control to the keywords, first by eliminating duplicates, misspelled terms, and acronyms (for example, using Online Public Access Catalog in lieu of OPAC). The team developed a spreadsheet to evaluate and correct the keywords:

Figure 1. Bibliographic Database Keywords, mid-Revision

<table>
<thead>
<tr>
<th>Accountability</th>
<th>Use for:</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Accreditation]</td>
<td>Instead, use:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[Acquisitions of materials]</td>
<td>[Acquisitions of materials, Purchasing]</td>
</tr>
<tr>
<td>Acquisitions</td>
<td>Use for:</td>
<td></td>
</tr>
<tr>
<td>[Administrative Organization]</td>
<td>Instead, use:</td>
<td>Administration</td>
</tr>
<tr>
<td>Adult education</td>
<td>Use for:</td>
<td></td>
</tr>
<tr>
<td>[Affective learning]</td>
<td>Instead, use:</td>
<td>Learning</td>
</tr>
<tr>
<td>ALA</td>
<td>Use, also:</td>
<td>American Library Association</td>
</tr>
<tr>
<td>ALC</td>
<td>Use, also:</td>
<td>Americans for Libraries Council</td>
</tr>
<tr>
<td>[Alignment Project]</td>
<td>Use, instead:</td>
<td>Strategic Planning</td>
</tr>
<tr>
<td>ALISE</td>
<td>Use, also:</td>
<td>Association for Library Information Science Education</td>
</tr>
</tbody>
</table>

This work made clear the need for a streamlined keyword list and more specific controlled vocabulary. The process of creating the controlled vocabulary involved refining the keyword list to reflect the specific field of information science, the LibValue Project in particular, and the works contained in the bibliographic database. Each term in the keyword list was carefully cross-referenced with each other term to which it related to more fully control the vocabulary, eliminate or mitigate ambiguity, and/or control for synonymous terminology. Finally, the hierarchy of terms was established, and notes were made for each term...
listing broader terms, narrower terms, and related terms (Figure 2).

**Figure 2. Example Hierarchy of Terms**

<table>
<thead>
<tr>
<th>Keyword</th>
<th>See</th>
<th>Used For</th>
<th>See Also</th>
<th>Broader Term</th>
<th>Narrower Term</th>
<th>Related Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic rank and tenure</td>
<td>Faculty, Librarianship</td>
<td>Information access, Information needs, Information retrieval</td>
<td>Cataloging, Bibliographic control</td>
<td>Information storage and retrieval, Information skills, Open access publishing, OPAC, Information literacy, Digital Divide</td>
<td>Electronic information resources, Information services, National Information Standards Organization, User behavior, e-Resources, Information resources, Preservation, Virtual information services</td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td></td>
<td>Information access, Information needs, Information retrieval</td>
<td>Cataloging, Bibliographic control</td>
<td>Information storage and retrieval, Information skills, Open access publishing, OPAC, Information literacy, Digital Divide</td>
<td>Electronic information resources, Information services, National Information Standards Organization, User behavior, e-Resources, Information resources, Preservation, Virtual information services</td>
<td></td>
</tr>
</tbody>
</table>

Terms were chosen for inclusion in the controlled vocabulary to most closely reflect the academic library mission. For example, the term *information dissemination* was eliminated from the final list of preferred keywords, in favor of the term *information services*. The value of information services and the return on investment that academic libraries get from the information services they offer to students, faculty, and staff is the idea most nearly in line with both the LibValue Project and the discipline of LIS, and therefore it was the term selected for the vocabulary. Each non-preferred term in the original keyword vocabulary was connected to preferred terms for related concepts that would be useful to users. In the case of *information dissemination*, related concepts included not only information services in general but also electronic information services, as well as methods of dissemination, such as *publishing*, *electronic publishing*, and *journals*, and venues for information dissemination: *institutional repositories and conferences*.

Once all the terms that should be related had been identified, they were organized with similar terms that were non-preferred, narrower and broader terms, terms that were almost the same but required their own entry, and related terms that had relevance to the same concept but would not necessarily be considered synonyms. These terms were filed in the spreadsheet under “used for,” “see also,” “narrower terms,” “broader terms,” and “related terms.” In the case of *information services*, broader terms included *information* and *services*, while narrower terms included electronic *information services*, *library services*, *reference services*, and *service quality*. The non-preferred term *information dissemination*, however, had entries under only one heading under the spreadsheet: “see.” Any time during the selection process that a term was placed on the spreadsheet in any of these columns, a mirror-image entry was made; when *assessment* was put in the “see also” column next to *evaluation*, *evaluation* was added to the “see also” column next to *assessment*. On a practical note, the use of special formatting, such as bold fonts and colored highlighting made this process of checking relationships and reciprocating entries easier to keep track of. Using multiple pages within the spreadsheet, one for each letter of the alphabet, also reduced visual confusion and the possibility of accidental deletion or other errors. As the vocabulary evolved, the team made formatting changes such as using both the acronym and full term together in preferred entries, with see references from each the acronym and full term. As the project came to a close, the terms were moved to a Microsoft Word document—eventually converted to a PDF file—and organized alphabetically, along with all of their related terms (Figure 3) to facilitate use of the vocabulary and the bibliographic database.
This document was used to modify the existing keyword library in the EndNote version of the database, reassigning keywords as necessary to reflect the new vocabulary (Figure 4).
When the EndNote library was fully revised, the bibliographic database was reloaded to the website with all the changes. At that point, the LibValue Thesaurus document was uploaded to the website and linked to the bibliographic database. The process of streamlining the keywords and creating the controlled vocabulary reduced the list of keywords to nearly 300.

To date, the LibValue bibliographic database contains about 1,000 citations for articles, conference proceedings, papers, and other documents relevant to the LibValue Project. Between the beginning of the project and October 2013, the bibliographic database was visited nearly 9,000 times by Internet users all over the world, including repeat visitors. This level of usage suggests that the bibliography has been not only an item of interest, but useful—and used—as well.

The vocabulary was not developed with international standards in mind, unlike the taxonomy developed by Gómez and Cañadas; aligning the thesaurus with existing standards could be a valuable improvement to work toward in the future. While control of the vocabulary designed for use with the bibliographic database must be maintained, the vocabulary itself, like the taxonomy designed by Gómez and Cañadas, “must be allowed to evolve over time according to the needs of the users and the characteristics of the documents.” While it is difficult to tell how well-used the thesaurus is as a resource separate from the bibliographic database, it is not unreasonable to assume that the increased efficiency of the keyword list in the bibliographic database would likewise enable researchers to function with higher efficiency when using the database. The controlled vocabulary, too, in its thesaurus form may be useful to researchers and the field of information science; in August of 2013 Gary Price called it “a potentially very useful 64 page reference resource (PDF) that might be useful when conducting research about library value measurement (value, outcomes, ROI),” further noting that it “will likely be of value in many situations.”

References


8. Ibid.

The LibValue Toolkit

Martha Kyrillidou, Henry Gross, Shaneka Morris, Gary Roebuck, and Amy Yeager
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The purpose of the LibValue Toolkit (http://www.libvalue.org/about/toolkit) is to bring together project descriptions and instruments used in the nine LibValue studies and to serve as an incubator for the academic library community in launching projects measuring library value. Values, Outcomes, and Return on Investment of Academic Libraries (LibValue) was a three-year study funded by the Institute of Museum and Library Services to define and measure ways in which academic libraries create value through research, teaching and learning, and social, professional, and public engagement. The project comprised nine individual studies:

• Scholarly Reading (two studies) assessed the value of library journal, book, and other scholarly collections to faculty, graduate students, and undergraduate students in the academic environment by examining patterns and outcomes of reading.

• The Value and ROI Comprehensive Study (two studies) took a holistic view of library services to measure the economic, environmental, and social value of the academic library.

• The Library Instruction Impact Study was a multi-method, quasi-experimental study of potential improvements to participating students’ research skills and attitudes about research tools and processes, as the result of participation in an extended multi-session instructional program.

• The Teaching and Learning Study measured use of library resources, facilities, and services in support of teaching through an online survey of instructors (including full- and part-time faculty, graduate teaching assistants, and other staff with teaching responsibilities).

• The Commons Environment Study assessed the value of library resources and services in a commons environment in support of the instructional mission of the university, demonstrating the value of the commons environment to the university’s efforts in learning, student engagement, retention, and graduation.

• The Special Collections Study assessed the value of digital special collections in support of the university’s goals in teaching, research, and outreach.

• The E-Books Study examined the value of e-books to library users as well as the value of e-books to libraries, by establishing a benchmark for e-book value determining the cost/use ratio of e-books at the university library, and verifying whether the cost-per-use of e-books matched the “value” that e-book users assigned when surveyed in a vendor-sponsored e-book study.

The toolkit is a summative presentation of the key findings of a series of studies demonstrating the value of libraries in new ways and an incubator for future actions. As we collaborate and compete with brands like Google, Amazon, and Facebook, among others, librarians and libraries are facing the need to engage new approaches and methods in describing and articulating the value of libraries in a global, interconnected, multi-faceted environment. Linked to the future of higher education, academic libraries are expanding their approaches into an integrated and immersive way in the fabric of their parent institutions. Academic library value is inextricably linked to the value colleges and universities deliver to students, faculty, learners and researchers.

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ABSTRACT

Purpose: This presentation focuses on the influence of academic position (master’s, doctoral, freshman, senior, etc.) and age on the information seeking and reading patterns of graduate and undergraduate students. Measuring reading patterns helps librarians understand how the library print and electronic collections fit into the overall reading needs of students.

Methods: The methods described here can be used to measure use and value of library collections and compare this use to other sources of scholarly information. A questionnaire was distributed at four universities in the United States to examine information seeking and reading behavior of graduate students and undergraduate students. Questions based on critical incident theory asked participants to reflect on their last incident of article and/or book reading, including time spent per reading, how they became aware of and obtained the reading, format of reading (print or electronic), and the principal purpose of the reading. In addition, demographic information such as discipline, age, academic status, and gender was gathered, as well as estimates of how many articles and books were read by each respondent in the last month.

Findings: Findings show that, although age influences the reading behavior of graduate students, academic status is a stronger influence, while age and academic status were both influential for undergraduate students. Research-intensive degree seeking students, such as doctoral students, read more articles and books, spend more time per reading, and read more thoroughly. Doctoral students obtain more readings from the library proportionally than other graduate students. Age did not significantly impact these patterns—older graduate students exhibited the same reading patterns as their younger counterparts. For undergraduates, academic status and age influenced the format of reading, numbers of readings, and time spent reading. As they progressed towards their degree, undergraduates read more articles in print form, and younger students were more likely to read articles and books in an electronic format. Age influences other reading patterns among undergraduates, such as number of readings, time spent reading, and where the reading is obtained. For instance, younger undergraduates obtain more articles from library collections. Compared to findings from surveys of faculty, graduate students rely even more on the library e-collections, while undergraduates rely relatively less so on these collections.

INTRODUCTION

Although graduate and undergraduate students have an increasing variety of choices and methods to access and obtain scholarly reading materials, time, cost, and availability remain key factors in how students decide to access and obtain article and book readings. Consequently, the library remains central to their research and course work, providing timely and convenient access to the highest quality materials. As part of the larger IMLS-funded Lib-Value Project (Value, Outcome, and Return on Investment of Academic Libraries), the Scholarly Reading team studied the library’s value in material access by examining scholarly reading patterns of graduate and undergraduate students as well as use patterns of library-provided sources.
This study grew out of an online survey distributed to graduate students at four universities and undergraduate students at three universities in the United States in 2012. For graduate students, we had 1,239 total respondents, with response rates ranging from 2% to 13%. For undergraduate students, we had 800 respondents, with response rates ranging from 1% to 3%. Respondents were allowed to leave the survey at any time, skip questions, or were timed out automatically if they began the questionnaire and did not complete it. Most of the questions have a lower number of responses. All respondents for a particular question equal 100% for that question.

Survey questions rely on a critical incident of last reading, in which the last incident of reading is assumed to be characteristic of normal reading patterns. Although the survey included scholarly articles, books, and social media, this presentation focuses on graduate student and undergraduate student reading patterns for scholarly articles and books. The core questions to this study ask: How important is the academic library in the scholarly reading lives of students? Does this value differ based on academic status, discipline, or type of material?

RESULTS

Scholarly Article Reading Patterns

The majority of article readings by graduate students and a significant portion of readings by undergraduate students are obtained through their university’s library system. In fact, 60% of the readings by graduate students and 40% by undergraduate students are obtained through their library’s collections, databases, or through interlibrary loan. Most article readings by undergraduate students (57%) are obtained through other means such as a school or department collection, course reserves, free web journals, and websites. Thirty-seven percent of the readings by graduate students are also obtained through these avenues. Only 3% of the readings by graduate or undergraduate students are purchased. Furthermore, student readings were overwhelmingly obtained through electronic sources. Ninety-percent of all graduate student article readings and 82% by undergraduates were obtained electronically. Of those student readings obtained through the library, 95% of the readings by graduate students and 89% by undergraduate students were obtained electronically.

Although we did not find any significant differences between demographic characteristics and where undergraduate students obtained scholarly articles, graduate student readings reflected some differences based on discipline ($\chi^2=25.866$, $p=.004$) and age ($\chi^2=18.645$, $p=.005$). Graduate students in the medical and health science fields reported obtaining more readings through the libraries than those in other disciplines. Fewer article readings by graduate students over 45 years of age were obtained through the library. Figure 1 illustrates the differences between disciplines and Figure 2 those between respondent age and article readings obtained through the library.

![Figure 1. Scholarly Article Readings Obtained Through the Library: Comparison of Graduate Student Discipline](image-url)
We did not find a significant difference among graduate and undergraduate students and the care with which they reported reading scholarly articles. Two-thirds of the readings by graduate students and 57% of those by undergraduate students are read with “great care to all or parts of the article.” Just over one-quarter (28%) of the readings by undergraduate students and 20% by graduate students are read with attention to the “main points.”

Browsing, searching, and a course outline or reading list are the most common sources for becoming aware of all article readings by both student populations. Article readings obtained through the library do not largely differ. Of the readings obtained through the library, searching (40%), a citation in another publication (16%), and browsing (13%) are the most frequent means of discovery for graduate students. For undergraduate students, searching (43%), browsing (26%), and a course outline or reading list (14%) are most frequent. We found a significant difference between discipline and methods of article discovery for graduate students ($\chi^2$=74.124, $p<.001$) (Figure 3). We did not find any significant discipline differences for undergraduate students.
Reading for a thesis or dissertation, to complete an assignment, and required readings were the most frequently reported principle purposes of article readings obtained from the library for both graduate and undergraduate students. Thirty-two percent of the article readings by graduate students were read for a thesis or dissertation, 25% to complete an assignment, and 11% were required readings. For undergraduate students, two-thirds were to complete an assignment, 13% were required readings, and 8% for a thesis or dissertation. Table 1 illustrates the differences among disciplines and principal purposes of reading for both articles and books.

Table 1. Principal Purpose of Readings by Discipline by Graduate Students

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Top Purpose: Articles</th>
<th>Top Purpose: Books</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sciences</td>
<td>Thesis/Dissertation (38%)</td>
<td>Thesis/Dissertation (53%)</td>
</tr>
<tr>
<td>Medical Sciences</td>
<td>Complete an Assignment (38%)</td>
<td>Complete an Assignment / Keep Informed (27% each)</td>
</tr>
<tr>
<td>Engineering/Technology/Mathematics</td>
<td>Thesis/Dissertation (34%)</td>
<td>Thesis/Dissertation (48%)</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>Complete an Assignment (37%)</td>
<td>Thesis/Dissertation (37%)</td>
</tr>
<tr>
<td>Humanities</td>
<td>Thesis/Dissertation (37%)</td>
<td>Thesis/Dissertation (47%)</td>
</tr>
<tr>
<td>Other</td>
<td>Thesis/Dissertation (39%)</td>
<td>Thesis/Dissertation (50%)</td>
</tr>
</tbody>
</table>
Scholarly Book Reading Patterns
Scholarly book readings are more likely to be purchased than article readings. Two-thirds of the book readings by undergraduates and nearly half (47%) by graduate students are purchased. By contrast, only 22% of the book readings by undergraduates and 32% by graduate students are obtained through the library. When examining the library-obtained book readings more closely, we found some differences based on academic status ($\chi^2=22.331$, $p=.004$) and respondent age ($\chi^2=22.205$, $p=.001$). Thirty-eight percent of the readings by PhD students and 26% by master’s students were obtained through the library. Graduate students aged 25–30 reported obtaining the most book readings through the library (Figure 4).

Searching was the most common reported means of discovering book readings. One-third of book readings by undergraduates and 27% by graduate students are discovered through searching. The second most commonly reported method for undergraduates was a course outline or reading list (32%). Graduate student book readings were also discovered through another person such as an instructor or colleague (25%) and through a citation in another publication (20%). Table 2 shows the differences between respondent discipline and method of discovering library books for graduate students ($\chi^2=45.611$, $p=.007$) and undergraduate students ($\chi^2=35.667$, $p=.077$).

<table>
<thead>
<tr>
<th>Table 2. Top Methods of Discovering Library Books by Student Discipline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Sciences</td>
</tr>
<tr>
<td>Medical Sciences</td>
</tr>
<tr>
<td>Engineering/Technology/Mathematics</td>
</tr>
<tr>
<td>Social Sciences</td>
</tr>
<tr>
<td>Humanities</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>
The principal purpose for book readings reflected those of article readings. Forty-three percent of book readings by graduate students were read for a thesis or dissertation, 14% to complete an assignment, and 13% were required readings. To complete an assignment (45%) was the most common purpose for book readings among undergraduate students. Just over one-third of book readings by undergraduates were required readings and just 7% were for a thesis or dissertation.

CONCLUSION
The library remains an important and central resource for graduate and undergraduate students’ academic work. Because they often face strict personal budgets and time constraints, the library’s collections, in particular its e-collections, provide free resources in a timely manner. Furthermore, this scholarly reading remains a vital part of scholarly work, as the students increase their knowledge in their field, work on their own research, and start out in their academic career. Maintaining the quality of the library’s collections will enable the budding professionals to have access to important information, and will improve the future of the academic endeavor.

—Copyright 2015 Carol Tenopir, Lisa Christian, and Donald W. King

REFERENCES
2. For the purposes of analysis, we combined the disciplines of engineering, technology, and mathematics into one category (E/T/M).
How Library Learning Spaces Contribute to Student Success: A LibValue Project

Regina Mays and Teresa B. Walker
The University of Tennessee, USA

Abstract
This lighting talk presents findings from two surveys conducted at the University of Tennessee, Knoxville to assess the value of Commons resources and services in support of the instructional mission of the university. The primary area of investigation is the link between student use of Commons resources and the contribution of the Commons to student success. The findings highlight usage of the physical space of the library, the importance of a positive learning environment, and the student articulation of positive outcomes. Gaining a better understanding of how students make use of the library Commons and its services has provided much-needed guidance for planning and decision making. Likewise, gathering information about how students use resources and services in the Commons, for coursework and college life, has demonstrated the value of the Commons environment to the university’s efforts in learning, student engagement, retention, and graduation.

Background and Context
LibValue: Value, Outcomes, and Return on Investment of Academic Libraries was a three-year study funded by a grant from the Institute of Museum and Library Services. Inspired by previous studies that attempted to measure the return on investment (ROI) of the library in the grants process, LibValue was designed to apply the ROI concept to all areas of the library. ROI in the strict sense (i.e., a monetary return on investment), however, is not the best way to measure some areas of library value. Student success is a complex phenomenon with many contributing factors and many possible measures. To explore the library’s contribution to student success, the LibValue team at the University of Tennessee focused on the contribution of library spaces, specifically the learning Commons, to student success.

The UT Libraries created the Commons in 2005. Since that time, the university has made repeated investments in updating and renovating the space. Demonstrating the value of this space to student success at the university and communicating that value to university administration was a priority of this study. To show value, we had to first consider the climate of the university. To some extent, the environment was influenced by changes in the higher education landscape. The first change was the Complete College Tennessee Act of 2010 that created a new funding formula based on outcomes as opposed to enrollment. The second was the Top 25 initiative at UT, the university’s new strategic plan to move UT into a position in the top 25 public research institutions. As part of this initiative, university administration developed metrics to gauge improvement, which included a section focused on undergraduate education. A major emphasis was placed on increasing first to second year retention rates and six-year graduation rates. A third consideration of the current study was an effort to align library goals with campus goals. A fourth factor was the requirement of the university’s accrediting body to assess and demonstrate outcomes.

Despite changes in the higher education landscape, a factor that remained constant and central to this study was the university’s retention rate. For over a decade, UT’s first to second year retention rate remained between 75 to 80 percent, well below its peers. The university had been conducting student exit surveys to determine why students leave the University of Tennessee. Top responses from students were: (1) UT is too large and impersonal, (2) I had trouble adjusting personally to UT, and (3) I did not feel like I was part of the university. While new factors in the university’s context inspired the study, the university’s retention rate served as the measure of success. Starting with current statistics and observations, the study aimed to correlate existing libraries and university data with student-reported information related to Commons usage and feelings about its contribution to their success at the university.
Research Approach
Building upon existing data and a strategic focus on undergraduate education, the study outlines four outcomes: (1) to identify and obtain the best data, drawing upon existing data and collecting new data, (2) to use the information for evidence-based strategic decision making, (3) to demonstrate value, and (4) to assess the contribution of the Commons to the retention and graduation of students. To facilitate evidence-based decision making, it was necessary to combine new and existing data in meaningful ways. Like many institutions, the UT Libraries was already collecting demographic and usage data from disparate sources, from gate counts and computer logins to survey data such as LibQUAL+® and The National Survey of Student Engagement. The first step was to inventory that data and to identify gaps. On the university side, an augmented demographic data set, with progress toward degree data, was needed. Within the libraries, student-reported data to complement usage data was required.

To obtain student-reported data, we created two surveys. The in-person survey focused on determining which services student populations were using during a Commons visit. The survey was distributed in the Commons, on paper, for one week in summer 2011 and one week in fall 2011 with 957 total respondents. The in-class survey was made available to a large general education course, Communication Studies 210/240 in spring 2012. It was administered via a participant management system and was one of several surveys that fulfilled a class requirement to participate in a research study. The in-class survey had 146 respondents—about 20% of the entire class. This survey contained detailed usage questions with information on time spent on activities. It also included a section on student feelings and perceptions about the value of the Commons to their success at the university. These two surveys allowed us to target a population and point of interest, undergraduates in their persistence toward graduation, and to compare that population to our total user base.

Valuable findings in this study come from the comparison of student reported use of services and resources in the Commons with student demographic and progress toward degree (retention, success, and years to graduation) data. Obtaining progress toward degree data required negotiation with the university to create an expanded student data set. The resulting data set allowed us to compare data about the Commons with student progress at the university. Usage data and reported value have already influenced decisions, at both the library and university level, regarding funding for equipment and spaces. The findings have informed evidence-based decision making in staffing, services, and other areas. In addition, correlating student usage of library resources and services with key markers of student success is one way the libraries has illustrated its value in support of the mission and goals of the university.

Findings
In many ways, the survey results revealed what many working in the Commons already suspected—students perceived that the Commons environment provided a space that created community and promoted learning. The survey also revealed surprises. The distribution of students using the Commons was quite even by class standing with seniors representing our largest user base (figure 1).
Having assumed that most of our customers were lower division undergraduates, and mainly freshmen, programming and engagement activities were marketed accordingly. We were pleased to see we were serving the needs of all class ranks and happy to suppose that use of Commons spaces and resources were increasingly important to students as they neared graduation. While this finding was interesting, its significance was not immediately apparent. Viewing the data through the lens of an administrator revealed a different picture. A common concern among any library administration is justifying funding to staff a commons area on a twenty-four hour basis with full time staff, especially when the perception is that first year students are merely using the space for socializing. The class standing data from the in-person survey compared with the reported usage data shows that students were not necessarily socializing in the space. More frequently they were upper division students working on assignments. This data was invaluable in learning about our users and their needs of the space during particular times.

Perhaps the most significant results of the study were those that revealed the student perception that the Commons contributed to retention. With “not finding one’s place at the university” being a top reason for leaving, we were especially pleased to find that just over 70% of respondents said the Commons makes them feel more involved in the university. An overwhelming percentage also said the Commons promoted learning and helped them do better in class.

Beyond facilitating decision making in the libraries, this data is part of the story the library tells about the Commons. While university administrators hear anecdotal evidence about the Commons from students and instructors and see students in the space, this data ties the numbers and the stories to success at the university. The key has been defining what constitutes success in our particular environment and crafting the survey to address those factors. For the University of Tennessee, retention and years to graduation constitute success. The student-reported data points overwhelmingly to the value the Commons
environment brings to the university. At the UT Libraries, this story helps us demonstrate the role the Commons plays in student success. Being able to successfully tell this story has resulted in funding for renovations as well as positions to support student success in the libraries.

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Notes


Demonstrating Library Value: Appropriate Methodologies and Practical Approaches at the University of Cape Town

Karin de Jager
University of Cape Town, South Africa

Abstract:
This paper discusses the University of Cape Town’s four-point mission statement and uses a values matrix to show how the mission statement may be used to design interventions and demonstrate the library’s contribution to the institutional enterprise. It proposes some practical approaches to exploring evidence and combining existing data with specifically targeted investigations to provide tangible evidence of the benefit and impact of academic library services.

In the current higher education environment there has been an increasing demand for the academic library to articulate its values with those of the parent institution in order to demonstrate its congruency with institutional goals and objectives and to give quantifiable evidence of the value it adds to the institutional enterprise. Although libraries traditionally keep many counts and records of all their activities, librarians in the developing world have by and large looked inwards to the library as an aim in itself. They have tended to focus on traditional library functions such as expenditure, stock, staff or circulation and not really attempted to show that their activities are aligned with and actually contribute to the greater institutional enterprise. This presentation briefly reported on a new, collaborative “Library Values Project” between the library and the Library and Information Studies Centre (LISC) that aims to demonstrate library impact on the university at large.

In exploring the concept of impact, it is important to remember that the term itself is neutral and refers to any difference, either positive or negative, that using the library may have brought about. Moreover, these differences may be intangible and not easily demonstrated, and the effects on users may vary considerably, so that a single activity will not necessarily have the same impact on different users.

When seeking evidence of impact, Poll\textsuperscript{1} was careful to note that evidence may be derived through different approaches. It may be inferred from conclusions based on data such as attendance, gate counts or seat occupancy; observed, for example by mining data of what users actually do; solicited by asking users and nonusers about their experiences and opinions, and derived from unsolicited communication, for example, e-mails, suggestion boxes or anecdotes. Quantitative outputs may be combined with qualitative reports and narratives to demonstrate value.

Perceptions of value are unique to a perceiver; like beauty, it is in the eye of the beholder and something will be regarded as valuable only if it is perceived to have worth or to be important. Perceptions of value may change with new experience, and evidence of value is only obtainable from someone who shares the same value system. It is therefore important in any attempt to demonstrate value to a university that, for example, values are shared.

Explicit evidence of what institutions themselves value may be found in their official mission statements. The UCT mission statement focuses on four main aspects, its research-led identity; its provision of quality education; its Africa-wide and international connections and partnerships; and its embrace of diversity among both students and staff.

The matrix below shows how interventions may be designed around the mission statement to demonstrate the library’s contribution to the institutional enterprise. Not all these interventions are in place yet, but the intention is to produce results for each of the domains to show that the library does indeed contribute measurably to all the facets of the university mission statement.
<table>
<thead>
<tr>
<th>The University</th>
<th>The Library</th>
<th>Possible Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCT mission statement</td>
<td>The library’s activities add value to the institutional mission</td>
<td>As may be demonstrated by studies of:</td>
</tr>
<tr>
<td>Research-led identity</td>
<td>• Consultation and collaboration between librarians and researchers</td>
<td>• Solicited evidence of library impact on research output</td>
</tr>
<tr>
<td></td>
<td>• Research Commons, a supportive space for emerging researchers</td>
<td>• Correlation between use of Research Commons and production of knowledge</td>
</tr>
<tr>
<td>Quality education to under- and postgraduate students</td>
<td>• Services, facilities and support that students value for their academic work</td>
<td>• Surveys in the Knowledge Commons and 24/7 venue about use and value</td>
</tr>
<tr>
<td></td>
<td>• Establishing links between library use and student achievement</td>
<td>• Data Warehouse project: student and library records to be linked</td>
</tr>
<tr>
<td>Africa-wide and international connections and partnerships</td>
<td>• Research collaboration</td>
<td>• Impact on UCT’s international rankings</td>
</tr>
<tr>
<td></td>
<td>• Unique African material freely accessible: UCT Institutional Repository</td>
<td>• Impact of use of repositories and research data</td>
</tr>
<tr>
<td>Environment embracing diverse student and staff community</td>
<td>• Library an intellectual meeting point and welcoming environment</td>
<td>• Multilingual assistance</td>
</tr>
<tr>
<td></td>
<td>• Knowledge Commons</td>
<td>• User-friendly services and web-presence integrated into user workflows and electronic course management system</td>
</tr>
<tr>
<td></td>
<td>• Research Commons</td>
<td>• LibQUAL+® results</td>
</tr>
<tr>
<td></td>
<td>• Diverse staff: fluent in different languages</td>
<td></td>
</tr>
</tbody>
</table>

The university’s research-led identity might be explored by investigating the use of the Research Commons (RC), the facility designed for master’s and doctoral students or “emerging” researchers, although it is also used by established researchers. The aim of this aspect of the investigation will be to find both anecdotal and hard evidence and establish to what extent knowledge creation actually takes place in this facility. As users enter by swiping their campus ID cards, it is possible to tell how frequently they visit the RC. Data from gate counts show that some students use this facility very frequently, almost on a daily basis in some cases. These results could be matched with records to see whether frequent users of the RC graduate sooner or publish more than those who do not, thereby showing that the RC actively supports research and knowledge creation. Evidence about knowledge creation may also be solicited from researchers working in the RC who can be encouraged to share information about their research outputs.

The Library Values Project Team, however, took an early decision to start the investigation by concentrating on the second focus of the UCT mission statement—on the library’s role in supporting student learning and quality.
Two investigations were conducted at the time of the end of semester examinations in June 2014 when student use of the library’s information commons and of its new 24/7 venue were particularly heavy. The first investigation concerned the sometimes long queues that formed in the Knowledge Commons (KC) while students were waiting to use a computer workstation. In spite of the general availability of campus-wide wireless Internet and many other computer laboratories at UCT, students were willing to wait patiently in these queues for the next computer to become available for use. There is no booking system for the workstations, as it has always been understood in KC that students are allowed to use a computer for as long as they need it.

The queuing process is orderly and when one computer workstation is vacated, the first person in the queue gets to use it. This investigation focused on queuing students and asked for how long they were prepared to wait for a computer to become available and what they were planning to do once their turn arrived. The student assistants (“knowledge navigators”) in KC handed out clipboards with questionnaires. Questioning did not commence before a queue formed. The survey was conducted between 10h00–17h00 every day for a week just before the end of semester examination period whenever a queue was evident. By 17h00 the queues had abated.

The questions enquired about the activities that respondents intended to engage in once a computer became available, with the purpose of exploring the use made of KC and the value that students think KC added to their academic work. In order for the questions to be anonymous and also as short as possible, the only demographic questions related to year of study and faculty affiliation. A total of 577 responses were received.

A similar study was conducted a few days later in the new 24/7 study area in the main library, which had opened its doors in 2012 in response to strong student demand. This facility is on the top floor of the library and opens at 23h00 when the main library closes. Once more, only limited demographic questions were asked and the questions enquired about what respondents do in the 24/7 venue, how long they intended to stay and how much they valued working there. For security reasons this venue does not have its own computer equipment although wireless Internet is available and students bring their own devices, so students were also asked whether they make use of an electronic device such as a laptop, tablet or smartphone. Survey forms were left on desks when the facility opened and the security guard, the only staff member present, assisted in collecting the forms. Although there were fewer respondents than for the KC study, a total of 257 responses were received during the investigation, which lasted for one week in each case.

Somewhat surprisingly, it seemed that the clientele at the two venues differed to some extent. Commerce students (who are very well served by their own, dedicated computer labs) are the most frequent users in both instances, but humanities students use KC far more than the 24/7 venue, and it was somewhat unusual to encounter in both venues a sizeable number of students from health sciences, who work on an entirely different campus some five kilometers away.

It was interesting to test the assumption that mostly first and second year students use KC and that the 24/7 venue would be popular with more senior students who have more work to do by their third year. Results however showed that 24/7 is attended by all the undergraduate students from first to third years, but in KC most students were third years, followed by second then fourth years. This finding also challenged the assumption that KC was mainly an undergraduate facility.

Free text questions asking about what respondents value most about working in the two venues were coded according to concepts that appeared most frequently. As the services and facilities in the two venues are different, the coding reflected this. In both cases the respondents most highly appreciated silence, a workplace that was quiet and where respondents could work in peace for as long as they needed.

In KC, the next most valued quality was the available technology: fast computers, big screens, efficient scanning and printing, followed by the clean and tidy working environment providing a scholarly atmosphere. The availability of help with both technical and study issues were highly regarded, and the group study rooms were appreciated.
In the 24/7 venue there are, for security reasons, no computers at all, but the entire venue receives wireless Internet, and students are encouraged to bring their own devices. There is no library staff assistance apart from a security guard. Here the draw cards were, in addition to the quiet space, the scholarly environment where others are also working, and staying in a safe place all night. Physical comfort in a warm, spacious and well-lit venue was noted as well. Most of the respondents used their own electronic devices, but some 12% did not use any device at all, and of those who did, 70% used laptops and the rest used tablets or smartphones in almost equal measures.

In KC the use of social media such as Facebook is not allowed unless “for academic purposes” and the student knowledge navigators keep an eye on this. Although there are no navigators present in 24/7 to watch what students are doing, social media did not seem to play a big part in their activities and repeated comments in both venues noted approvingly that respondents were not distracted by social media. The question of whether respondents thought that working in the respective venues enabled them to get better marks for their courses produced very clear results. In KC 86% and in the 24/7 venue 92% of the respondents agreed that indeed they thought working there resulted in them achieving better marks.

Preliminary findings such as these are showing that students do indeed value working in the library. This study has demonstrated that by providing excellent learning opportunities in supportive environments, students believe that they obtain better marks, thus illustrating that the library is indeed contributing to the university mission of providing quality educational experiences that are appreciated and valued.

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Notes

2. In South Africa, bachelor’s degrees typically take a minimum of three years to complete.
Developing an Outcome-Based Evaluation Data Collection Tool: Lessons Learned

Thea Evenstad
McMinnville Public Library, USA

Abstract
Outcome-based evaluation (OBE) is a systematic way to assess the extent to which a program achieves its intended results. OBE seeks to answer two questions: (1) how has your program made a difference in your community? and (2) how are the lives of your participants better as a result? Inspired by an OBE training at the Oregon State Library, Thea Evenstad created a data collection tool to evaluate one-on-one technology sessions at McMinnville Public Library. This talk will focus on the results from the first six months of data collection (beginning January 2014) and will outline the process of developing, implementing, and modifying an OBE data collection tool. Additionally, learn how the library uses the data collected and how the use of OBE has evolved at McMinnville Public Library. This presentation demonstrates a public library case study of the practical application of OBE as an inexpensive and time effective way for libraries to gather qualitative data about programming and services for evidence-based decision making.

Introduction
What is an outcome? All programs have results, but outcomes are intended results. Outcomes are the benefits to people who participate in the program, like achievements or changes in skill, knowledge, or attitude. Outcome-based evaluation is a systematic way to assess the extent to which a program achieves its intended results. Outcome-based evaluation is also a tool that librarians can use to demonstrate that libraries have an impact on the lives of their users.

Method
The logic model may be used as a planning tool for outcome-based evaluation. Logic models are used to link the resources and activities of a program to that program’s intended results. Table 1 is from the Outcome-Based Evaluation Logic Model Worksheet included in the Oregon State Library’s outcome-based evaluation training manual for libraries.3

The Oregon State Library’s Library Service and Technology Act (LSTA) Five-Year Plan for 2013–2017 includes this goal: “Develop a culture in libraries that promotes evaluation and use of evaluation results.” Additionally, the Oregon State Library will now require outcome-based evaluation to be part of LSTA and Ready to Read grant proposals in Oregon. In the summer of 2013, the Oregon State Library sponsored a series of outcome-based evaluation trainings for library staff. Those trainings were supported by the Institute of Museum and Library Services through the LSTA. Training participants received Sara T. Behrman’s Outcome Based Evaluation: A Training Manual for Libraries.2

While outcome-based evaluation can contribute to a culture of evaluation, this method is not used for formal research. Outcome-based evaluation does not use sophisticated data collection or manipulation techniques and it does not account for all variables. Outcome-based evaluation requires fewer resources than formal research but can provide value to library staff as an inexpensive and time effective way to gather qualitative data about programming and services for evidence-based decision making.

The logic model may be used as a planning tool for outcome-based evaluation. Logic models are used to link the resources and activities of a program to that program’s intended results. Table 1 is from the Outcome-Based Evaluation Logic Model Worksheet included in the Oregon State Library’s outcome-based evaluation training manual for libraries.3
The parts of the logic model that are most important for outcome-based evaluation are the outcome and these five elements: indicators, applied to, data source, data interval, and goal or target. At the Oregon State Library training on outcome-based evaluation, participants practiced applying this to an existing program at their own libraries.

**Applying the Logic Model**

McMinnville Public Library offers one-on-one technology help sessions for library users. Anyone may make an appointment with a librarian for assistance with a particular technology task. Typical tasks include setting up an e-mail account or transferring library audiobooks to an mp3 player. Anecdotally, the program is a success and there is high demand for this service. One-on-one technology session participants are very appreciative and often tell librarians how much they value the service and what a difference it makes in their lives. Outcome-based evaluation is one tool for capturing the outcomes of this program in a way that helps the library have more evidence for communicating about library service out in the community and making decisions in the library.

Applying the logic model to this pre-existing program meant identifying the outcome and the five elements for evaluation. The outcome of this program determined during the outcome-based evaluation training is “adults demonstrate an improvement in their knowledge of a technology task.” Please see Table 2 for the other components of the model.

**Table 1**

<table>
<thead>
<tr>
<th>8a. Required Outcome 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>8b. Indicator(s)</td>
</tr>
<tr>
<td>8c. Applied to</td>
</tr>
<tr>
<td>8d. Data Source</td>
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<tr>
<td>8e. Data Interval</td>
</tr>
<tr>
<td>8f. Goal</td>
</tr>
<tr>
<td>(1)</td>
</tr>
<tr>
<td>(2)</td>
</tr>
</tbody>
</table>

**Table 2**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Applied to</th>
<th>Data Source</th>
<th>Data Interval</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number and/or percentage of adults who demonstrate an improvement in the technology topic they request</td>
<td>Adults who request one-on-one technology help at the library</td>
<td>Pre- and post-assessments, written comments, librarian observations, photos</td>
<td>Start and end of session; compile every 6 months</td>
<td>Eighty percent of participants demonstrate improvement</td>
</tr>
</tbody>
</table>

**Developing the Outcome-Based Evaluation Tool**

Participants in the outcome-based evaluation training identified next steps for implementing outcome-based evaluation in their libraries. After practicing applying the logic model to a pre-existing program, evaluation of the one-on-one technology sessions seemed like a good place to start collecting data and teaching other library staff about outcome-based evaluation. Collecting data through an online form would be too cumbersome for the library users who access the one-on-one technology help service at the library; many of
these library users are starting with computer basics. Therefore, I designed a data collection tool on a half-sheet of paper and brought it to my reference team.

We discussed the tool at our meeting, and the reference team members provided some excellent feedback, suggesting that we allow people to give their name and phone number to provide us with the option of tracking return users and following up after the session. We also wanted to include a photo option. At the outcome-based evaluation training, participants discussed how photos can be great data sources. Photos do not always tell the whole story but when paired with other quantitative and qualitative data, they can have an impact, and they carry a lot of information for those unfamiliar with the library and its programs. We did decide to revise our photo release form as part of the process of modifying this data collection tool.

After several iterations, the reference team adopted the data collection tool at our reference meeting in January 2014. The data collection tool ended up being one double-sided sheet of paper, with one side the updated photo release form. The version that we piloted during the first six months of data collection includes these elements: a title (“McMinnville Public Library One-on-one Computer Training”), a brief description of the service and why we collect the data, the question “What task are you working on today?,” participant name, participant phone, name of the librarian assisting, request to take a photo, a three-question pre- and post-assessment questionnaire, a space for written comments, and the McMinnville Public Library logo. The pre- and post-assessment asks one-on-one technology session participants to rate their responses on a scale of one to five, where one is low and five is high. Please see Table 3 for the pre- and post-assessment.

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
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</thead>
<tbody>
<tr>
<td>1……2……3……4……5</td>
<td><strong>Please rate your knowledge of this task.</strong></td>
</tr>
<tr>
<td>1……2……3……4……5</td>
<td><strong>How comfortable are you doing this task on your own?</strong></td>
</tr>
<tr>
<td>1……2……3……4……5</td>
<td><strong>How likely are you to do this task in the future?</strong></td>
</tr>
</tbody>
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**Results**

Ninety-five percent of respondents responded that their knowledge of the technology task increased during the session. Ninety-five percent of respondents indicated increased comfort doing the task on their own. Eighty percent of respondents indicate they are extremely likely to do this task in the future. Of those, sixty-five percent indicate that it is a result of participating in the technology help session. We aggregate the data in an Excel spreadsheet that is available on the library staff shared drive. We do enter the data from the handwritten outcome-based evaluation sheets but at this scale it is manageable.

Most participants grant permission for McMinnville Public Library to take a photograph of them with the librarian assisting them. Photos are available on the shared drive for the uses outlined in our photo release form. So far, these photos have already been used in presentations, in flyers in the library to advertise the one-on-one technology sessions, and at this conference.
Librarian Kris Lutsock assists a one-on-one technology session participant with Internet basics.

Additionally, written comments provide us with a wealth of qualitative data about these sessions. The vast majority of comments are positive. Some that we have received include “very helpful,” “love it,” and “thanks for this friendly, awesome program and the folks who assist us.” One way that we have used these handwritten comments is to scan them or take photos of them and store them with the other photos from technology one-on-one sessions.
Stories and comments are passed on to our library director for her to share at meetings. She is often asked “so what is happening at the library?” and likes to have a story ready. Internally, it has been great for our reference team to have a more holistic picture of the program. The reference team also has evidence of the effectiveness of the program and the overall positive perception of the service. One of our staff ground rules is to “share good news and positive energy” and this is one way that we achieve that. This implementation of outcome-based evaluation is just a starting point for McMinnville Public Library, but we are confident that we will continue to develop this practice in our library. Our library director has chosen outcome-based evaluation and library impact storytelling as the focus of our library staff development day in November 2014.

Practical Implications
This paper demonstrates a public library case study of the practical application of outcome-based evaluation as an inexpensive and time effective way for libraries to gather qualitative data about programming and services for evidence-based decision making. Implementing outcome-based evaluation took minimal time and resources to apply to an existing library service and has yielded positive results. Qualitative data can be used both internally and externally to improve service and communicate about the library in a detailed, data-driven way.

—Copyright 2015 Thea Evenstad

Notes
1. “Library Services and Technology Act Five-Year Plan 2013–2017” (Oregon State Library: Salem,

3. Ibid.
GRAD Connect

Nancy Slight-Gibney and Wendy Ames
University of Oregon, USA

Abstract
The University of Oregon Libraries Assessment Team partnered with a market research consultant to conduct focus groups with graduate students to elicit information on their library experience and the support they receive from the libraries in their roles as students, researchers, and teachers. We conducted nontraditional sessions that included storytelling, graphic facilitation, and brainstorming. Seventeen library faculty and staff engaged with sixty-four graduate students in 2.5-hour sessions. Through extensive, guided debriefing we identified challenges and frustrations, positive affirmations of what is working well, and aspirations and “wish-fors.” Subsequent all staff meetings focused on the aspirations—what the graduate students wanted, if resources were not an issue. Some changes have already been implemented, and the focus group results continue to inform library decision making.

In January and February 2013 the University of Oregon Libraries conducted a qualitative research project with the objective of understanding and improving the graduate student experience at the University of Oregon. The UO libraries’ Assessment Team was charged with conducting a targeted user assessment during that year. We chose to focus on graduate students for four reasons:

1. LibQUAL+® survey results from 2005 and 2010 indicated to us that graduate students use the physical library as frequently as undergraduates and use the virtual library as frequently as faculty.
2. We had no existing advisory group for graduate students, unlike faculty and undergraduates who had standing committees, which offered regular opportunities for formal feedback.
3. Growing the graduate student population was and is a campus priority.
4. Today’s graduate students are tomorrow’s faculty; this presented an opportunity to develop a better understanding of the perspectives on library services from this generation.

Once the assessment team decided on the target audience and the general strategy of conducting focus groups, Wendy Ames, a market research consultant, was hired to guide the process. The members of the assessment team had little or no experience with qualitative research, and hiring the consultant also served a skill-building purpose. Working together, we came up with the strategy of conducting several groups in the same place at the same time. That is, using a large room with eight conversations happening simultaneously rather than conducting separate sessions for each group. The energy created by this “big event” was a key element of the process.

GRAD Connect consisted of focus group sessions in three locations on different days. It included 2.5-hour nontraditional, graphically facilitated sessions at the main UO campus in Eugene and also at our branch campus in Portland and a 1.5-hour roundtable discussion at the Oregon Institute of Marine Biology (OIMB) in Charleston, Oregon. Participants were provided lunch and $50 campus cash cards as incentives. Recruitment occurred through library subject specialists, the graduate school, and graduate student coordinators in each academic department. Initially we had a waiting list for participation, but late cancellations enabled us to accommodate everyone on the list.

During the main sessions (excluding OIMB) the students were divided by discipline into round tables set up in a large room. The decision to divide by discipline allowed for homogeneity within the groups—an opportunity to get more of a sense of shared experience—while the debriefing sessions to compare the data from each group allowed library staff to understand where there were commonalities of experience and disciplinary differences.

Ms. Ames served as the lead facilitator in the room, guiding the entire event. In addition, there was a conversation leader for each table from the
assessment team and a volunteer library staff member to serve as notetaker for each table. Ms. Ames also provided the discussion guide for the rest of us to follow and conducted brief focus group training for the table group leaders. Altogether we had 64 graduate student participants and 17 library staff.

The graphic facilitation process included three exercises for each table to work through. The first was for each participant to work individually and select three to four images clipped from magazines to tell a story about their library experience. Each person then put their selected images up on the wall and explained their story to the group at the table. The note taker wrote each concept that came up on a sticky note and put the notes up next to the story images. Then each table group worked together to identify common themes that emerged in the stories—again with the note taker writing all the comments to the side. These themes were reported out to the room as a whole. The final exercise was to imagine, if one had a magic wand and no limitations, what students would like library services to be. Each table worked together to draw a picture of what their ideal academic support system would be. They were provided plenty of magazine images, Play-Doh, colored markers, and other props to use in developing their picture. Each table then presented to the room what they had used their magic wands to create.

The GRAD Connect sessions were enlightening and energizing, but that was only the beginning of the process. Analyzing the qualitative data required a lot of follow up work. Ms. Ames transcribed all the sticky note comments that went along with the images. She then led the library faculty and staff participants through a debriefing process that spanned several days, reviewing the textual notes along with the images. Specifically, for each disciplinary group we identified: challenges and frustrations; current sweet spots; and aspirations and “wish-fors.” Then we looked across all of the groups to identify areas of convergence and divergence.

Finally, we focused on the aspirations and wish-fors to identify themes for library action:

• Website and discovery. Graduate students wish it were easier to understand what the UO libraries have to offer and wish for tools that would help them intuitively search through the maze of both online and offline resources that are available.
• More and different technology. Graduate students want the best technology available from the UO libraries for their teaching and learning needs. There was a lot of disciplinary divergence on exactly what was needed, but there was a lot of convergence on a desire for expensive software site licenses needed for their specific programs.
• Collections and resources. Graduate students wish for more media content and electronic resources. They also want full text resources, textbooks, curricular material, and more tier-one journals. They want the library to end recalls. As we probed this issue it primarily relates to students trying to avoid the cost of buying textbooks.
• Access and hours. Graduate students want the UO libraries and their resources to be accessible more often. The main library is open 24/5 but does not open until 9:00 a.m. on Saturday and Sunday morning. The desire for early morning hours on weekends reflects needs that are different from most undergraduates. In Portland, the service hours were not in sync with the needs of part time students who use the library after their evening classes end at 8:00 p.m.
• Point-of-need help and more orientation. Graduate students want to more fully utilize all of the services and resources the UO libraries have to offer. Though orientation is currently done at the beginning of the academic year by library subject specialists, the perception is strong that they are not quite getting what they need when they need it.
• Better study space. Graduate students wish for more study spaces in the UO libraries, and they would like these spaces to support their needs around studying effectively for long hours. They name desired attributes such as quiet, brightness and natural light, warmth, openness, privacy, and security. Comments from graduate students who also teach indicate a desire for a space where they can do their own work away from interruptions from their students needing help with assignments.
• Relaxation space. Graduate students also wish for spaces that are relaxing, comfortable, and can help them endure or cope with long periods of study away from home and/or family. There was also a strong desire for a communal space where graduate students could work together,
relax and have a cup of tea, or bring their children in the evening.

• The broader campus environment for graduate students. There are strong wishes for more community engagement and more building of community/social interaction amongst students, instructors, and practitioners. Financial issues were frequently mentioned—issues that the library was not necessarily expected to solve—but this did relate back to the possibility of helping with more copies of textbooks on reserve and site-licensing software.

These results were then taken to an all staff meeting to brainstorm actions that could be taken to address the issues brought out in these themes. Some immediate actions were already in the planning stages and GRAD Connect served as additional input: bringing up a new ILS, redesigning our website, improving linking to e-books, and evaluating loan policies. We also began offering e-delivery of articles and chapters from our own collections to graduate students, a service we were already offering for faculty. New initiatives that came as a direct result of GRAD Connect included a deeper examination of access hours and technology offerings in branch libraries and creating a more structured means of information sharing with the graduate school.

Our next steps will include looking at the results of the 2014 LibQUAL+ survey to see if there have been any significant changes in graduate student satisfaction; scheduling a meeting of our new dean of libraries with the graduate student advisory council; paying particular attention to graduate students’ strong views on library space when engaging in facilities planning; and enhancing our fall term orientation efforts.

Overall the GRAD Connect experience was an excellent opportunity to learn more about user needs and experiences and an opportunity for our library staff to develop qualitative assessment skills. Information gained through this process will continue to inform library decision making for years to come.

—Copyright 2015 Nancy Slight-Gibney and Wendy Ames
Abstract
At Northwestern University, a partnership between the library and the Office of Fellowships provided an opportunity to assess the efficacy of research consultations. Using usability tools and reviewing citations of sources found and used, librarians were able to create significant data on student research behavior. Perhaps more importantly, there was also an exciting opportunity to create data that can articulate the value of library resources and librarian expertise by focusing on the research consultation. This collaboration has generated significant goodwill among campus partners and also has heightened librarians’ awareness to assessment as a venue for outreach as well as a method for articulation of value.

An informal conversation between members of Northwestern’s Office of Fellowships and the library’s User Experience department led to planning for an assessment project. The possible outcomes of the project that were identified as most important to the success of this endeavor were to:
- Obtain observational data on how students utilize research tools to discover sources
- Articulate the value of the pairing of a research consultation with a research fellowship
- Create enhanced CTEC (course evaluation) data for the program’s self-evaluation
- Create data to support the continuation of funding for university programs

The Posner and Davee Summer Fellowship program was selected as a good trial for an assessment of research consultations and student use of sources. The fellowship is aimed at students who are rising sophomores at Northwestern’s Weinberg College of Arts and Sciences. Nominations of students from underrepresented backgrounds are solicited from faculty. Eighteen students then spend eight weeks in the summer shaping a scholarly project from beginning to end with the help of a faculty mentor, and must orally present their findings, and a bibliography, at a final presentation event. The methodology proposed was to have the students provide an initial working bibliography, which they would bring to a research consultation with a library subject specialist. Students would spend a few minutes literally searching online while the librarian observes what they are doing and how they are searching; then the librarian would ask and record questions about the logic of searching and then make some suggestions. Individual specialists and the coordinator of research consultations would deliver the data to the assessment librarian, so that there would be no personally identifiable information to maintain. Then, later in the summer, after the students deposited their bibliographies into a folder, the sources could be viewed by the assessment librarian in order to put together an aggregated list of final sources.

This collaboration between the library and the Office of Fellowships was possible, in no small part, because of a 2011 divisional reorganization that created the user-engagement focused department, User Experience. This department was made up of Learning Services, Undergraduate Services and Spaces, and Web and Mobile Services units, as well as the assessment librarian. More importantly, this department sought to create an infrastructure and support for the entire library in understanding and reaching out to students, faculty, and campus partners. An additional advantage was that the units within this department were able to involve themselves in various projects undertaken by the other units. Projects led by the Web and Mobile Services and the Learning Services units helped inform and provide tools for the work needed in this endeavor. The undergraduate services and spaces librarian was also instrumental by referring the Office of Fellowships to the assessment librarian, recognizing the shared interest in assessment.
The question may well be asked, why would there be a focus on research consultations? Sometimes this service is also known as research appointments or one-to-one instruction sessions. Perhaps we can first define the service using Magi and Mardeusz’s recent definition: “…a reference service in which the librarian meets with a student in a scheduled session away from the reference desk.” One important clarification might be that the librarian generally has time to prepare on a particular topic for a particular student or researcher, which is also a considerable advantage for any possible assessment activity. Anecdotally, it seemed that the requests for research consultations were going up, even as the demand for reference questions were going down. However, since this information is generally not tracked or reported except in librarians’ individual performance reviews, there was no real quantitative way to measure this service. There certainly are an abundance of resources and existing case studies of assessment of library instruction sessions, whereas examples of assessment of research consultation services appear few and far between. And yet, it seemed that research consultations could be assessed in a similar fashion to instruction sessions, and would also offer an opportunity for far more effective (if slightly time-consuming) insight into the student research experience than the average reference question.

What we were able to glean from the sources that the students brought seemed to provide contradictory information at first. Taken as an aggregate dataset, the sources that students brought showed an interesting amount of diversity in both format and in method of discovery. However, there was a stark paucity of diversity in both areas at the individual level. Instructor recommendations (37%) and Google (20%) were the dominant methods of discovery of sources, but the remaining 43% was from varied library-related resources (the library’s Integrated Library System, Libguides, Worldcat), although there was one student who browsed a bookstore shelf at a local museum.

Of the 14 students who brought sources to the research consultation, half of them brought primarily scholarly journal articles. Four students brought in citations of books, and the other three split between news articles, websites, and films. Of the total number of sources, the distribution followed relatively closely (20 scholarly journal articles, 12 books, 4 news articles, 3 films, 1 website, and 1 e-book). This diversity seemed like good news. Although for each individual student, searching in more than one area was unusual, and success with multiple tools was nearly nonexistent. Only one student successfully found a scholarly journal article and a news article using two separate searches (Google and a database), but they were the only one of four who had multiple formats on hand. The other three had all gotten their sources from their faculty advisor. Others tried to use the library search tool (the ILS), and even in the interviews had difficulty finding their material, and said that they revert to Google when results were deemed “overwhelming.”

When I compared the final results, however, of the fourteen final bibliographies that I was able to access, the percentage of students who had multiple types of sources in their bibliographies skyrocketed from 17.6% to 71.4%. Only four of them provided just one type of source. All four of these students solely utilized scholarly journals, and actually provided some of the clearest final bibliographies. This confirmed our hope that, after meeting with a librarian subject specialist, students would be able to discover more types of high-quality sources than the single type that they had found previous to the research consultation.

Also intriguing in the final citations was that although book usage increased, the major increases were in scholarly journal and website usage. Almost all of the website usage was from nonprofit, government, or educational sites, with the other instances being relevant trade websites for patent citations. The only decrease was in news article usage, which was slight. Almost all of the sources were available via library access, and most were from online resources. In fact, over 80% of the final sources were from online sources, only a very small amount of the sources were not available through Northwestern Library catalog (9%), and all of them were available through our consortial ILL borrowing abilities.

This fellowship, paired with the research consultation, steered students towards a vastly increased usage of scholarly journals and authoritative websites. However, both the raw numbers and the usability assessment confirmed our suspicion that undergraduates have a great level of difficulty successfully utilizing two or more
types of source-finding tools on their own. One of the most advanced users of library resources was the sole student who volunteered the information that they had learned how to find scholarly articles during a library instruction session in their freshmen seminar, but even this student only used one database at first. On the other hand, multiple students struggled to find sources in our catalog or through commercial search engines that they had previously found. One of the most intriguing interactions was when one student tried to search Google (on a staff workstation) for a book on African-American political comedians, using the keyword “Black Comics.” This was the name of the book, but all it brought up in Google was lots of hits for graphic novels with the word “black” in the title. The student expressed mild shock that Google on this machine did not have a view of “books” appear at the top of search results, which offered an opportunity for a conversation about Google personalization filters and that Google results are not really replicable from person to person. This gap in awareness of commercial search engines may be an important thread to pursue as we considered “assessing the assessment” and refining both our tools and questions. However, even more important for the future would be incorporating some faculty feedback component, especially as it did not seem appropriate or effective for librarians to guess at what level of efficacy or appropriateness a source was being used in the students’ arguments.

Although there have been some personnel changes at Northwestern, the Posner Research Consultation Assessment project continues on. Before the assessment librarian left for a position at the Illinois Institute of Technology, he passed on contacts and activities to the head of user experience, the outreach and community services librarian and the assistant head of research and information services (who now coordinates research consultation requests). And the assessment librarian has been working on launching a rebranded and comprehensive research consultation service at IIT as well. This initiative has sought to hit many of the same aspects of assessment and engagement that the Posner project found useful and productive.

At the end of this project, besides the gratifying welcome received from faculty and campus partners, the greatest success that came out of this project was that the Office of Fellowships used this data in their request for continued funding of the Posner & Davee Summer Fellowships. Although there are clearly improvements that can be made, and much more work that can be done in the area of research consultation assessment, it is apparent that this is an important aspect of librarian expertise that we need to better leverage in order to articulate our value as librarians, and as campus partners.

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Endnotes
Abstract

The topic of this presentation is the evolution of the measurement process created by Zoltán Szentkirályi and Hollie Gardner to measure patron usage of the Fondren Library Center Information Commons at Southern Methodist University. The primary question of interest was “How do people use the Information Commons space?” The first template for recording observed usage, the “Detailed Template,” was inspired by ethnographic methods and yielded a wealth of details. This template also required a substantial and intensive observation effort and multiple sessions for a complete picture of usage, which quickly became unsustainable. The first template later evolved into a second template, “One Overall Map,” inspired by a headcount approach consistent with a current ongoing library headcount process. This template gathered fewer details, but allowed for greater quantitative consistency and simplified map markings that could be used for quantitative exploration after-the-fact. Developing these custom templates to measure characteristics of Information Commons usage at the Fondren Library Center has been a valuable learning experience for gaining insight into the advantages and disadvantages of the detailed and simplified styles of observation when put into practice.

After arriving at SMU two years ago as the new director of assessment for Central University Libraries, I began to take stock of the improvements we needed to make in our data collection and statistical reporting process. Over the course of the first year, I was able to initiate numerous localized solutions working one-on-one with various departments. As I approached my second year in early 2013, the university was entering a pivotal phase of the Second Century fundraising campaign, dubbed “The Year of The Library” in support of our upcoming library renovations, as well as the grand opening of the George W. Bush Presidential Library in April of 2013. It was and continues to be a very exciting time of preparations and transformations, with an influx of new talented library personnel, and increased opportunities for collaboration on a broader scale.

One of the primary foci of the planned renovation is to redesign the Information Commons area on the first floor of the Fondren Library Center, the main library at SMU. Our dean and director of Central University Libraries asked me to gather some data on how the students currently use the Information Commons. At the time, we had just recently created a user experience librarian position, and found an excellent candidate in Hollie Gardner to join our library staff. Before she was inundated with the outreach and first-year instruction responsibilities associated with her position, I had the opportunity to work together with her to develop a template for observing the usage of the Fondren Library Center Information Commons.

The topic of this presentation is primarily the evolution of the measurement process we created, first inspired by ethnographic methods, and later evolving toward a headcount approach consistent with a current ongoing library headcount process. In brainstorming a template that we could use to record observations, Hollie drew upon her training and experience in ethnographic methods at UNT and UT-Arlington, while I drew upon my training and experience in statistics and quantitative analysis before and after arriving at SMU.

The primary question of interest was “How do people use the Information Commons space?” In practical terms, this translates into many sub-questions about the usage of each area, the different equipment available, the needs of the students, how well those needs are being met, and any anomalies that would help inform an improved design for a Learning Commons. Henceforth, I shall refer to the space as the “Info Commons.” During the initial phases of discussion, I suggested that we divide the large Info Commons space into subsections for observation. We initially started with seven areas, but later refined these to five.
overall areas within the Info Commons. The areas can be described as follows:

- **North Bay Windows**—a variety of study tables, sofas by the windows and PC computers both for student login only as well as for general public access.
- **South Bay Windows**—a variety of study tables, sofas by the windows, and a Mediascape collaborative display for multiple laptops to plug into one large display.
- **Table Computers**—PC and Mac computers arranged on flat table space that allows for open interaction and viewing across and in between each station.
- **Carrel Computers**—PC and Mac computers arranged in traditional carrel spaces that offer some privacy, blocking out the ability to view across or in between each station.
- **Print/Scan Stations and Reference Desk**—intermittent usage with frequent short bursts of activity at the print and scan stations, along with some extended activity as well, but generally more transient.

We each initially agreed to pick one of the designated spaces and observe usage for a fifteen-to-twenty minute period, using a basic map of available furniture, which Hollie created using PowerPoint shapes. This first observation attempt was mostly in written form, and required several additional hours afterwards for both of us, in order to write up our observation notes so that they were presentable. We quickly realized that this approach would require too much time, and moreover, would not yield sufficient quantitative information.


Based on this suggestion, we began to brainstorm a set of measurement dimensions that would reflect the student needs and behaviors, in a similar template form, but customized for the Info Commons. We settled on a detailed list of measurement dimensions to track, for a succession of three time intervals:

- Counts of arrivals and departures
- Counts of students using various furniture/equipment types
- Counts of supplies that patrons brought with them
- Counts of various types of anticipated patron activities
- Counts of transitions from one area to another
- Counts of conversation types
- Total patron count for the area

Concurrently, I used Hollie’s approach to refine the basic maps of PowerPoint shapes, adding more detail and refining the visual depiction of each area. We agreed on a naming system for the different furniture and equipment groupings, in case we wanted to reference a particular location in the observation notes. For example, the tables were labelled in alphabetical order as TA, TB, TC, TD, and so on. The resulting template (“Detailed Template”) is shown in Figure 1.
We created five detailed templates, one for each area, which were largely identical but had a different map according to the area. The one exception was the Print/Scan/Reference area, which had a slightly different list of detailed activities to match the transient nature of that area.

This detailed approach constitutes a continuous observation of patron activity in one area over an extended timeframe. The task amounts to logging a complex accounting of observed activity, supplies, usage, seating location, and transitions. The biggest advantage to this approach is the wealth of data that could potentially be harvested from the detailed log of counts and written notes. We were very ambitious about the observation scope. In practice however, we found that a tremendous amount of intensive focus is required to adequately document all the dimensions listed on the detailed template within a given timeframe. Even with such a focused observation effort, it was difficult if not impossible to accurately capture all of the activity happening simultaneously in a particular area. As a matter of necessity, the observer had to prioritize which measures to focus on, essentially removing the reliability that each indicated measure was a complete accounting of actual activity during that timeframe.

To compound the complexity of a single observation session, in order to construct a whole picture of activity in the Info Commons at a given time, it required that we make five separate observations, one in each area, and all at different points in time. Altogether, with the reduced reliability of multiple metrics and the separated timeframes of the multiple observations, the consistent relational attributes of the data were greatly reduced. As such, the template was not conducive to quantitative coding, and the...
quantitative interpretation of the counts became problematic. Some of these issues could possibly be alleviated by recruiting a team of people to contribute their time towards gathering the observations. Overall, we found this approach to be unsustainable, especially for one or two people working without a bigger collaborative effort.

After creating the initial detailed template and making several rounds of observations, Hollie delved into her primary job responsibilities and she was no longer able to devote time to continued observation. I was faced with continuing some form of the Info Commons observations on my own. With an awareness of the need to simplify the template, I decided to streamline the process to be consistent with an ongoing headcount procedure, which I implemented in the prior year for the security guards on their evening rounds. I combined the maps from the five templates into one overall map template for the whole Info Commons space, and replaced the detailed accounting of activities with a simple headcount for each of the five areas. The resulting template (“One Overall Map”) is shown in Figure 2.

**Figure 2. One Overall Map**

Observations using the map template consisted of a walk through the Info Commons using a simplified coding scheme: marking an “X” for each patron at their location on the map, drawing a circle around those who were conversing in a group, and writing down any significant anomalies directly onto the map as observed. These markings on the map would then allow for more detailed analysis after the observation session had ended or at any time in the future by revisiting the recorded map. I also increased the number of potential observation times from three to six, but in practice I never exceeded three walk-through measurements in one day.
Clearly some of the details from the prior template are lost when using the “one overall map” approach. However, the process resulted in one map of the entire Info Commons area, it provided a snapshot of seating or spaces that were occupied, and it provided patron counts in each area, consistent with an ongoing head count process already established. In addition, the map template succeeded in measuring some of the most interesting aspects of the detailed template, such as the frequency of conversations, percent of patrons seated at sofas, tables, PC or Mac computers, and the actual or relative percent capacity that sofas, tables, and PC or Mac computers were being utilized. Most of all, this template allowed an individual to quickly take the measurement snapshot for a given time, then return to their office to tally the counts and continue with other responsibilities for the day, knowing that the map markings would enable additional quantitative exploration of Info Commons activity after-the-fact. Not only does the comprehensive nature of the map data empower quantitative analysis of observed activity according to the originally intended grouping of the five areas (or for the Info Commons as a whole), but it also enables the same data to be analyzed according to revised definitions of areas, furniture, and equipment that may become evident in the future.

Developing these custom templates to measure characteristics of Information Commons usage at the Fondren Library Center has been a valuable learning experience for gaining insight into the advantages and disadvantages of the detailed and simplified styles of observation when put into practice. Having overcome the initial hurdle of discovering a sustainable process, there are a number of hurdles yet to be cleared before producing actionable data. Next steps include exploring a team-based approach for establishing a regular schedule of measurements, and refining the way map measurements are recorded in order to answer additional questions that may arise from the renovation design team.

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Watch and Learn: Assessment of Online Video Tutorials

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Abstract
In 2009, the University of Washington Libraries began producing online screencast tutorials as a way to support library instruction and to serve as point-of-need assistance in answering reference questions by e-mail or chat reference. Research has shown that students are capable of learning from video tutorials, but while the usage of the tutorials has grown over time, producing them is resource-intensive. Are these videos worth our time and resources to produce and maintain? Do users actually watch and learn from them? This paper describes an assessment project of online tutorials by analyzing usage statistics, surveying and interviewing users, and piloting an in-class learning assessment.

Introduction
Screencasts and video tutorials have become a popular way for libraries to provide help information and orientations. The University of Washington Libraries began producing online screencast tutorials in 2009 in order to support library instruction and online reference services. The Libraries Online Learning Subcommittee conducted a review of the literature and at that time found the literature was more focused on the advantages of online information literacy tutorials and less on specific assessment methods. However, the existing literature demonstrated a variety of evaluation options for us to consider as we designed our own multimodal assessment study. In 2012–2013, we analyzed usage statistics, investigated the usability of our tutorials, and piloted an in-class learning assessment.

Methodology
Statistics
The first phase of our assessment project began with analysis of tutorial statistics gathered from Google Analytics and LibGuides. Data included pageviews, unique pageviews, average time spent on a page, date a tutorial was added to YouTube, and number of locations a tutorial was embedded within LibGuides.

Marketing
The libraries’ Triennial Survey and smaller-scale program assessments seem to point to a lack of awareness of tutorials. As a result, we set out to determine if tutorial promotion would result in an increase of tutorial usage statistics. We created separate communication plans for promoting tutorials with faculty and with librarians. A set of fifteen tutorials was selected for promotion with faculty, librarians, and students. Tutorials were shared with faculty through new faculty orientations, the Libraries Teaching Support website, the Libraries Teaching Support flyer distributed to all new faculty and TAs, and through the IT Connect technology e-newsletter distributed to faculty and staff of the University of Washington (UW). Librarians were shown examples of how tutorials can be successfully integrated into classroom teaching via the libraries’ online newsletter and blog. Librarians were instructed how to embed tutorials in subject and class guides, and also encouraged to embed a new “featured tutorials” box that would rotate the fifteen tutorials at targeted points in the academic year. Additionally, featured tutorials were placed on social media (Facebook and Twitter), the libraries website, and subject liaison blogs during targeted points in the 2012–2013 academic year.

Results were mixed. Some tutorials received a significant uptick in usage including the “How do I find background information on my topic?” tutorial which increased by 124% compared to the prior year. The “Using an EBSCO database” tutorial received a 76% increase in usage. Most significant, the “What is a scholarly journal article?” tutorial received a near 200% increase in usage. Most significant, the “What is a scholarly journal article?” tutorial received a near 200% increase in usage. Results were mixed. Some tutorials received a significant uptick in usage including the “How do I find background information on my topic?” tutorial which increased by 124% compared to the prior year. The “Using an EBSCO database” tutorial received a 76% increase in usage. Most significant, the “What is a scholarly journal article?” tutorial received a near 200% increase in usage. Other increases were less significant such as a 1% increase in the “How do I use Interlibrary Loan and Document Delivery Services?” tutorial. A few tutorials trended downward in usage during the marketing campaign. These tutorials included “Chat with UW librarian,” “How do I find DVDs and videos?” and “How do I access e-books?”
Embedding Tutorials
When exploring tutorial usage, we wanted to see if there was a correlation between the number of times a tutorial is viewed and the number of times it is embedded within our subject and class LibGuides. We assumed higher visibility within a subject or class would translate to an increased number of times a tutorial is viewed. We were surprised to learn that this was not the case.

Table 1. Comparison of the number of tutorial embeds in LibGuides and the number of pageviews

<table>
<thead>
<tr>
<th>Tutorial</th>
<th># of Embeds in LibGuides</th>
<th># of Unique Pageviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Find Dissertations</td>
<td>44</td>
<td>498</td>
</tr>
<tr>
<td>Find E-books</td>
<td>148</td>
<td>677</td>
</tr>
<tr>
<td>Search an EBSCO Database</td>
<td>18</td>
<td>2345</td>
</tr>
<tr>
<td>Find Full-Text Articles</td>
<td>345</td>
<td>836</td>
</tr>
<tr>
<td>Google: Boolean Operators &amp; Phrase Searching</td>
<td>13</td>
<td>13202</td>
</tr>
<tr>
<td>Information Cycle</td>
<td>12</td>
<td>2335</td>
</tr>
<tr>
<td>Off-Campus Log In</td>
<td>136</td>
<td>690</td>
</tr>
<tr>
<td>Scholarly Journal Articles</td>
<td>62</td>
<td>1806</td>
</tr>
</tbody>
</table>

Also of interest are the tutorials that were selected for marketing. The “How do I log into resources from off campus?” tutorial was linked in 58 guides during the 2011–2012 academic year and received 1,347 pageviews. Marketing tutorials to librarians increased the number of guides in which the tutorial was embedded to 136, but pageviews for the tutorial dropped to only 942 during 2012–2013. The same was true of the “How do I access e-books?” tutorial. In 2011–2012, the e-books tutorial was linked in 134 guides and received 1,076 pageviews. After marketing, the e-books tutorial was included in 148 guides, yet the number of pageviews dropped to 811. Based on our statistics, we do not believe there is a strong correlation between the usage of a tutorial and the number of locations it is posted within a subject or class guide.

Surveys
In order to identify our tutorial audience, we embedded a Google form survey within each tutorial box in LibGuides. Respondents could indicate they were UW undergraduate students, UW graduate students, UW faculty/staff, or other with the opportunity to identify themselves. The survey ran for over 7 months, and we received 488 responses. We discovered that an overwhelming number of our tutorial users were University of Washington undergraduate students. Many of our tutorials offer a basic introduction to library tools and concepts so it would seem fitting that students would encounter them early in their academic career.

Usability
In winter 2013, we began the usability portion of our tutorials assessment. We tested four tutorials representing a wide range of topics and formats:
1. Practical video (“Using an EBSCO database”)
2. Conceptual video (“What is a scholarly journal article?”)
3. Video compared with static guide on the same topic (“How do I use UW WorldCat to find books, media and articles?”)
4. Prototype of a conceptual interactive online module (“Research 101: Evaluating Resources”)

We had several questions that we hoped to answer through the testing:
• How effective are the tutorials in teaching a user something?
• How do users locate the tutorials and in what context?
• What format do users prefer to learn about something?
• What feedback do users have on design and interaction elements, as well as content?
We recruited novice undergraduate library users by posting a call for volunteers on the libraries website, social media channels, various department e-mail lists, and flyers in the library. Volunteers completed a short survey that asked for contact information, student status, major/department, and experience using the libraries’ discovery systems. Ten students were picked from a pool of 72 volunteers, based on their reported lack of library familiarity, scheduling, as well as representing a variety of disciplines. A facilitator conducted one-hour test sessions in the libraries’ usability lab; the sessions were recorded with Morae Usability Testing software and observed remotely by members of the subcommittee. Students were offered a $10 university bookstore gift card at the end of each session.

For the usability tests, we asked the students to complete a task (e.g., “find a scholarly article”), look for help information on how to accomplish that task on our website, watch the targeted tutorial, critique it, and then complete the task again using information they may have learned from the tutorial. Students were assured at the start of the test session that we were more interested in understanding their thought process so that we could improve our help content. Students were asked to think aloud throughout the entire test session in order to explain their thinking. Notes were taken for each test session and clips of each session were shared with the entire subcommittee to discuss.

**In-Class Assessment**

In spring 2013 we began the in-class learning portion of our assessment project. A total of three introductory writing/research courses were tested, each using a different tutorial. There were 10 sections, and a total of 192 students. First, we mapped our Libraries Learning Goals and Objectives to the learning outcomes of these tutorials and later developed rubrics to evaluate student learning. We created pre- and post-test prompts that could be used by librarians and graduate assistant instructors in their information literacy lessons.

There were several problems with the in-class learning assessment, and therefore we are unable to draw any conclusions at this point. The test instrument itself had issues: the pre-test questions did not map well to post-test questions; some of the evaluations were incomplete; and many of the answers did not reflect information from the module. We would likely do this portion of the assessment over again after adjusting the test prompts and rubrics, and testing them before deploying with actual classes.

**Findings**

After compiling the results of our various assessments, we were able to identify several points of thematic overlap between the usage patterns for libraries tutorials and the articulated preferences of undergraduate participants in our usability study. Further, we were able to gain a greater understanding of the qualities that help make a video tutorial appealing to UW’s core base of patrons. These thematic findings were reviewed by the Online Learning Subcommittee, and then subsequently summarized in a set of written best practices, which included the following sections:

**Identify your users.**

According to both our embedded survey of tutorial users and the UW Libraries Triennial Survey of undergraduate, graduate, and faculty patrons, the primary users of the video tutorials are undergraduate students. By acknowledging the demographics of our tutorials users, we can better plan our tutorial topics, resources, and choice of vocabulary.

**Focus on a very specific problem or need.**

According to our usability study, students are more inclined to watch videos with titles that address specific research problems over those that give broad overviews of research topics or tools. Thus, while a tutorial may include some “big picture” information, it is important to prioritize points of confusion and immediate need, especially in your title. This preference was also reflected across our usage statistics, which showed that tutorials that specifically targeted common questions or needs (e.g., “How do I access full-text articles with the proxy bookmarklet?”) were often watched more often or for longer durations.

**Evaluate your format choice.**

Video can be a good vehicle for some content, but it can be a deterrent to those who want to find an answer quickly. According to our usability study, students often prefer to receive help with frequently asked questions in written formats like
web pages, rather than in videos, as these are faster and easier to browse.

**Keep it really, really short.**
Because students click tutorials in the hopes of discovering practical answers, they dislike encountering videos over two minutes in length. Both our usability testing and usage analysis suggested that longer tutorials are only watched when deployed as part of in-class lessons or assignments. To keep student attention, we recommend that librarians keep tutorials within the 30–90 second range.

**Skip the introduction.**
UW students reported in the usability study that librarians spent too much time at the beginning of tutorials introducing or “orienting” users. Instead of wasting precious seconds, we recommend that librarians start tutorials with the important information students want and need.

**Match written words with spoken words.**
If you display text as part of your recorded tutorial, match the audio to correspond to this text. According to our usability study, it is difficult for users to listen to something and read non-corresponding text at the same time.

**Embrace quality production values.**
While a good tutorial does not have to be flashy, students do notice when librarians overlook basic production values such as image clarity, music, pacing, and audio quality.

**Assign a practical title.**
In usability testing, UW students desired clear and practical tutorial titles. This preference once again correlated with the results of our usage analysis, and could help explain why marketing efforts did not make a bigger difference. We recommend that librarians ask themselves “What problem does this tutorial address?” and always be as descriptive and to the point with tutorial titles.

**Make interactive components obvious to users.**
While interactive components can make course-embedded tutorials more engaging, usability study participants reported that such elements must be clearly highlighted so that users know when and how to engage with them. That said, because of the length restriction, we do not recommend that most point of need tutorials have interactive components.

**Conclusion**
Surprisingly, our key findings were less about what users learn from tutorials, and more about what motivates them to watch tutorials in the first place. Overall, our assessment project revealed that motivation for watching a tutorial is dependent on a number of factors, including title, length, and production quality. The point-of-need tutorial can still be relevant if it is practical, problem oriented, and follows the best practices identified above.

The most significant implication from our study is that tutorials offer two distinct types of content, and their success depends on the context of their use. The more practical videos are problem oriented and can be helpful when one encounters a problem. Other videos are more conceptual and teach ideas similar to the threshold concepts in the ACRL Framework for Information Literacy for Higher Education. For example, many UW librarians show the “What is a Scholarly Journal Article?” video during information literacy instruction sessions in order to frame scholarship as a conversation. Still, during the usability study interviews, multiple students said if they needed to find the definition of a scholarly article, they would prefer to read a text explanation rather than watch a video. No matter how central these concepts are to information literacy, most students will not seek to learn about them by watching a video on their own. We argue that conceptual videos still have a purpose, but only in course-embedded instruction.

Our assessment project findings will guide the revision of our “How do I?” tutorial portal. Instead of a repository for all help videos, we are now focused on creating a student-centered FAQ resource that provides answers to questions that students really do ask. This new portal will also include other formats besides video, most likely text with images. We no longer expect students to find and watch conceptual videos on their own, so these will live on a separate page, and librarians can use them for course-embedded instruction. By translating our findings into best practices, and ultimately revising our tutorial portal, we hope that librarians will create and assess online help tutorials in a more strategic manner.
Acknowledgement
We would like to thank Rebecca Bliquez, Nicole Dettmar, Amy Lee, the UW Libraries Teaching and Learning Group, and the UW Libraries Assessment and Metrics Team for their guidance and contribution to the work that has been described in this article.

Notes
Abstract
Many academic libraries today invest heavily in web-scale discovery services to meet the needs and expectations of undergraduate students. Now that these services have been in use for a few years, has the initial excitement waned? Do students still feel they have “won the lottery?” This paper describes the results of a user satisfaction survey conducted in 2013, comparing satisfaction levels with the service against those evident in 2011. We will show how students at Ryerson University like using Search Everything, powered by Summon.

Introduction
As web-scale discovery services (WSD) continue to gain adoption by many academic libraries, there is a need to evaluate their ongoing impact on the information seeking behaviors and preferences of users. Following up on a previous study about user satisfaction with Summon, the authors, two librarians at Ryerson University Library, were interested in comparing information seeking behaviors two years after the WSD implementation. Replicating the previous survey conducted in 2011, this second study on Summon aimed to see if students introduced to the WSD were still using the tool. Additionally, it was of interest to see if new students were also using the library’s WSD instead of, or in addition to, other web-based resources.

To provide context, Ryerson University is located in the heart of downtown Toronto and has a single library serving the campus. There are nearly 30,000 full-time students with 2,300 graduate students and almost 800 faculty members representing a comprehensive range of disciplines in the arts, business, and sciences.

In this study, the researchers compare survey results between the 2011 and 2013 iterations to see how satisfaction and use of the tool has changed over time. In 2011, the survey was conducted only months after launching Summon, branded “Search Everything,” at Ryerson University. Two years after implementing our WSD, would the initial excitement expressed by users about having a one-stop search option available have waned? Would the improvements the Library and Information Technology Services Team has made to Summon translate into more satisfied users? These were a couple of the questions we wished to explore with our survey data.
Methodology
The institutional Research Ethics Board must first review all research involving human subjects. Once the Research Ethics Board approved the research proposal, the study was able to proceed in a two-phased approach—as had been done in the previous study. We selected the same mixed-methods approach used in 2011, utilizing both quantitative and qualitative measures. First, an online survey was distributed to the Ryerson University community, including faculty, staff, and students via an e-mail invitation. Due to some concerns about survey fatigue related to other recent campus-wide questionnaires, Ryerson’s University Planning Office agreed to a one-third representative sample versus a census of our population. A sample population of ten thousand Ryerson community members was provided by the university administration. In addition to the e-mail invitations, a prominent, graphic advertisement was placed on the library website homepage to encourage additional participation (see Fig. 1). Even though the survey was voluntary, there were still 2,997 respondents, which when compared to the university population, provided a representative sample. We chose to use SurveyMonkey® as the online questionnaire software as it provided flexibility in survey design as well as a variety of analysis tools.

After the data had been collected from this survey it could be compared with the previous iteration of the research on Summon satisfaction done in 2011. Looking back on the results from the previous survey, we decided to make a few changes in the variables; these were modifications that would not affect the comparability of results between the two versions of the survey. First, the gender variable was removed, as it did not produce any significant variations in information seeking behaviors and was not a focus of our research. Second, two variables were added to further explore some questions of interest that emerged from the 2011 survey. We included year of study to examine whether there were different behaviors exhibited by different levels of undergraduate students. Also, we modified the question about which preferred databases the respondents were using. In place of an open text box, a list of popular databases and an “other” option was used to facilitate easier analysis of the results, including cross-tabulations and comparisons.

As the survey was anonymous, upon completing the Summon survey respondents had the option of...
linking to a separate survey to submit their contact information for our incentive draw. They could also at the same time sign up to volunteer to be a participant in a follow up focus group. The Survey Monkey® responses were then exported to SPSS for analysis, where comments were coded and descriptive statistics were run.

Findings
Because our University Planning Office required us to use a one-third sample of the population in 2013, whereas we were able to e-mail the whole population in 2011, we received fewer responses to our 2013 survey. Though we received fewer responses to our more recent survey, the response rate has improved. With a population of roughly 30,000 full-time equivalents (FTEs), our response rate was close to 30% in 2013, versus slightly over 20% in 2011. Overall, we found that there has been a 16.4% increase in survey respondents who used Summon in their last search for academic information. This finding reinforces the trend we see in the searches recorded in Summon use data, which reports annual increases of between 20 and 30% (Fig. 2). See Table 1 for a comparison of the responses in 2011 and 2013, and figure 2 for an illustration of representativeness.

Figure 2. Summon usage trend 2011–2014

![Summon Usage Trend 2011 to 2014](image)

Table 1. Response rate and result summary

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6344 responses</td>
<td>2997 responses</td>
</tr>
<tr>
<td></td>
<td>3930 (61.9%) entered incentive draw</td>
<td>2249 (75% entered incentive draw)</td>
</tr>
<tr>
<td>Year</td>
<td>Data</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5363 (84.5%) completed the survey</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4861 (88.9%) were undergraduates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>424 students indicated interest to participate in focus groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 participated in focus groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>51.5% used Summon</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2495 (83.2%) completed the survey</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2197 (88.1%) were undergraduates</td>
<td></td>
</tr>
<tr>
<td></td>
<td>192 students indicated interest to participate in focus groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 participated in interviews</td>
<td></td>
</tr>
<tr>
<td></td>
<td>67.9% used Summon</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3. Representativeness**

**2013 Summon Survey Representativeness**

**Satisfaction and Ease of Use**

Survey respondents were asked, “How easy is Search Everything to use?” They could choose one of five answer options, ranging from “not at all easy” to “extremely easy.” Comparing survey iterations, we found that in both result sets, the vast majority of users chose an answer between moderately and extremely easy, with “very easy” being the most frequently selected answer choice. We were surprised to see that survey respondents in 2013 rated Summon less easy to use than their 2011 counterparts. The frequency of “extremely easy” and “very easy” have both decreased, while “moderately easy,” “slightly easy,” and “not at all easy” have all increased (see Fig. 3). One possible explanation for this change is that search tools are becoming increasingly user-friendly, and expectations around what is considered “extremely easy” in this arena are constantly rising. The interface has not changed, and neither have the facets or other search options, between 2011 and 2013.
When asked, “How easy is it to find resources you need using Search Everything?” survey respondents were more impressed with Summon in 2013. The researchers found the opposite change from ease of use ratings to the ease of finding resources ratings. The frequencies of “extremely easy” and “very easy” have increased in 2013 versus 2011, while the frequencies of “moderately easy,” “slightly easy,” and “not at all easy” have all decreased. One very likely explanation for this improvement in ease of finding resources is that there were some technical issues with the library’s link resolver that prevented users from reliably linking to full text content they found using Summon in 2011. These technical issues were largely fixed, and the vendor also expanded the number of “direct linking partners” for which the link resolver is bypassed, delivering end users to the full text in one click.
Survey participants were also asked, “How satisfied are you with using Search Everything?” In both 2011 and 2013 data, the researchers found a strong correlation between the ease of finding resources and their overall satisfaction rating (as measured by their response to this question). Over 75% of the respondents who said that it is very easy to find resources using Summon indicated that they were also very satisfied with Search Everything. The same finding applies for extremely easy to find resources and extremely satisfied users.
Another way the researchers explored satisfaction with Summon was through the open comments provided by survey respondents. In 2011, there were 1,295 respondent comments, and 412 in 2013. The researchers coded these as positive, negative, or neutral. If a survey respondent provided comments including both positive and negative elements, that comment was given a score for both positive and negative. Just as responses to the overall satisfaction survey question were more positive in 2013, more of the open comments provided in 2013 were positive in tone. Fifty-one percent of the comments were entirely positive or contained positive elements, compared with only 33% in 2011. Negative comments have increased as well, but only slightly, from 32% to 35%. We received far fewer neutral comments, declining from 36% to 21% in 2013 (see Fig. 7).
Breaking the comments and survey results down by faculty allowed the researchers to explore whether satisfaction varies by academic discipline, and if there were any changes in this breakdown between 2011 and 2013. We compared the comments by faculty and saw that the Faculty of Arts showed the greatest improvement, moving from a majority of negative remarks to a positive majority (see Table 2). Responses for the question, “How satisfied are you with using Search Everything?” are also most positive within the Faculty of Arts in the 2013 survey data (Fig. 8).

The Faculty of Communication and Design is the only faculty that displays an increase in negative comments, but this is a small change (less than 3%). This faculty includes creative departments like fashion, image arts, and interior design. It is likely that the indexing coverage Summon provides for image-based resources used by students in this faculty is not of the same caliber as indexing of text-based content. Graduate students continue to provide us with more negative than positive comments. Note that the Faculty of Science was established after 2011.
Figure 8. Survey results analyzed by faculty for the question “How satisfied are you with using Search Everything?”

Table 2. Comments by discipline 2011 versus 2013

<table>
<thead>
<tr>
<th>Faculty/Discipline</th>
<th>2011 % Positive</th>
<th>2011 % Negative</th>
<th>2013 % Positive</th>
<th>2013 % Negative</th>
<th>Positive Comment Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>N/A</td>
<td>N/A</td>
<td>80%</td>
<td>20%</td>
<td>-</td>
</tr>
<tr>
<td>Ted Rogers School of Management</td>
<td>56.36%</td>
<td>43.64%</td>
<td>68.37%</td>
<td>31.63%</td>
<td>↑</td>
</tr>
<tr>
<td>Continuing Education</td>
<td>59.32%</td>
<td>40.68%</td>
<td>66.67%</td>
<td>33.33%</td>
<td>↑</td>
</tr>
<tr>
<td>Arts</td>
<td>47.12%</td>
<td>52.88%</td>
<td>66.04%</td>
<td>33.96%</td>
<td>↑</td>
</tr>
<tr>
<td>Engineering &amp; Architectural Science</td>
<td>51.61%</td>
<td>48.39%</td>
<td>58.14%</td>
<td>41.86%</td>
<td>↑</td>
</tr>
<tr>
<td>Community Services</td>
<td>50.64%</td>
<td>49.36%</td>
<td>53.06%</td>
<td>46.94%</td>
<td>↑</td>
</tr>
<tr>
<td>Communication &amp; Design</td>
<td>43.14%</td>
<td>56.86%</td>
<td>40.82%</td>
<td>59.18%</td>
<td>↓</td>
</tr>
<tr>
<td>Yeates School of Graduate Studies</td>
<td>35.71%</td>
<td>64.29%</td>
<td>38.89%</td>
<td>61.11%</td>
<td>↑</td>
</tr>
</tbody>
</table>

Use of the Summon Service versus Other Search Tools

When asked to indicate all of the resources used in their last search for academic information, the most common choice in 2011 was the Ryerson Library (selected by 65.86% of respondents). By 2013, this has changed dramatically (see Fig. 7). Respondents now indicate their use of Search Everything (Summon) with the highest frequency. The use of both Ryerson’s library and other libraries has declined at about the same rate (approximately half). We might infer from this that use of print library collections has declined over the past few years. Ryerson has invested heavily in electronic collections, and has implemented demand-driven acquisition (DDA) for e-books, loading discovery records for e-books into Summon® as well as the library catalogue. An encouraging finding is that the use of websites and search engines for academic
searching has declined, and the decrease in use of academic databases is small. Because the library continues to invest in subscriptions to academic databases and for the Summon service, it is a positive finding that implementing our WSD seems to have had a bigger impact on the decline in use of freely available resources than on the academic products we provide.

Figure 9. Resources used for last academic search 2011 versus 2013

![Resources Used in Last Academic Search](image)

Not all respondents to the survey had used Summon, so when comparing between survey respondents who had used Search Everything for their last search for academic information and those who had not there were some contrasts. The results revealed dramatic differences between the two groups, as well as between the two survey iterations. Figure 9 shows that in 2011, 62.8% of respondents who used Summon in their last academic search had also used the Ryerson Library. In 2013, the use of any other resources, including the library, was practically nonexistent. These findings may suggest that in 2011, users were not confident that all of their research needs could be met by using Search Everything, whereas in 2013, their full needs are being met by the service.

Figure 10. Resources used ( Summon users only) 2011 versus 2013

![Resources Used in Last Academic Search: Summon® Users Only](image)
Among the group that had not used Summon for their last search for academic information, we see a different picture (see Fig. 11). Here, the top resource selected is “web search engine” with 96.5% of respondents, as opposed to 22.35% who had used an academic database. We did not distinguish between Google Scholar and other search engines in the list of resources, and we do not know how well our undergraduate students are able to distinguish between scholarly and non-scholarly sources in web search engine search results, so we cannot assume that these users are using inappropriate resources. When looking at the results for Ryerson Library, we see that there is still heavy use among this group.

**Figure 11. Resources used in last academic search (non-Summon users only) 2011 versus 2013**

<table>
<thead>
<tr>
<th>Resources Used in Last Academic Search: Non-Summon® Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Academic Database(s)</td>
</tr>
<tr>
<td>Websites</td>
</tr>
<tr>
<td>Other Library</td>
</tr>
<tr>
<td>Ryerson Library</td>
</tr>
<tr>
<td>Professor/instructor</td>
</tr>
<tr>
<td>Web Search Engine</td>
</tr>
<tr>
<td>Friends</td>
</tr>
<tr>
<td>Date</td>
</tr>
</tbody>
</table>

**Conclusion**

Based on these findings, we can conclude that user satisfaction and adoption of Summon have both improved significantly since we implemented our WSD in 2011. The target audience, undergraduate students, have embraced this as their primary search tool, with the vast majority of these students having used it exclusively in their last search for academic information. Nevertheless, there was an unexpected result when the 2013 survey respondents found Summon less easy to use when compared to the results of the 2011 survey. Possibly it is the growing expectations of an increasingly search savvy population that have caused a shift in the positive perception of WSD services. In this conference proceeding, we primarily present the quantitative results from the survey. Accordingly, there is still a need for further research on the qualitative open-ended responses that the users provided. Qualitative findings from our focus
groups and interviews were not discussed above, as they largely simply confirm what we see in the survey data, or are specific recommendations for improvements. After completing two studies on Summon, the results certainly indicate that the majority of the users find our WSD tool satisfactory, with one respondent even saying it was “absolutely amazing!”

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Endnotes

2. User feedback in the open comments of the survey.

References
Assessing Library Research Consultations: A Mixed-Method Approach

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Abstract
Academic librarians often struggle to assess the impact of less traditional teaching and learning exchanges with students, such as research consultations. This paper identifies three methods for assessing the impact of one-on-one research consultations on student learning. These methods include student research journals, a single-case research methodology using a multiple baseline across participants, and a follow-up focus group. In addition to an explanation of methodologies and preliminary results, this paper will identify and describe the unique teachable moments generated by this applied research project housed in a course where students learn about applied research.

Introduction
While one-on-one research consultations have been a staple of public services for academic libraries, strategies for assessing this service are often troublesome. As far back as the 1980s, librarians have documented the development of consultation programs, including the successes, pitfalls, and the re-designation and design of library space around these programs. While studies such as these posit that the research consultation does contribute, at least in part, to student learning, best practices for assessing these contributions have yet to be identified.

Recently, embedded librarianship has overshadowed traditional reference services as a more effective and proactive service offered by libraries. There are multiple models of embedded academic librarianship, each with varying levels of involvement between the librarian and a particular class or program. An embedded librarian is one who is dedicated to a particular instructor and group of students in order to attend to the specific needs of a course or learning experience. This model shifts the emphasis from reactively answering research requests in a vacuum to developing a unique understanding of what students and faculty need. Embedded librarianship can take place in online and face-to-face contexts and can take the form of group instruction or one-on-one consultations. In many cases, students are required to meet with a librarian to help them begin their research more intentionally and to periodically check in with the librarian to provide updates on their progress. A growing focus of scholarship in this area is on the development of embedded librarian programs and students’ perception of their learning as a result of these embedded experiences. However, students’ attitudes about their experiences with librarians in the embedded model and the relationships they have shaped is largely underrepresented. Therefore, this assessment project focused on direct measures of student learning as well as how students’ attitudes about librarians changed as a result of their experience with an embedded librarian.

Population and Context
This investigation involved a cohort of ten graduate students in the Master of Special Education program in the School of Education at Webster University who were enrolled in two sequential applied research courses. In the first course, implemented in the final eight weeks of the fall semester, students learn the fundamentals of applied educational research as they gather and examine the current research in the field. The major assignment of this first course is a substantial review of the literature in an area of special education research. The second course is
implemented in the spring semester for sixteen weeks for students to develop and implement a research study based on the literature review completed in the fall. The literature review from the fall semester and the data from the spring are then paired to make a complete research paper due at the end of the spring semester. The instructor of both courses was a strong supporter of the library and had previously required students to meet individually with the librarian for a one-on-one research consultation before beginning their research in the fall semester. In the spring of 2013, a campus team composed of the course instructor, an instruction and liaison librarian to the School of Education, and the director of institutional effectiveness formed to study the effects of required one-on-one research consultations for students in the applied research class. The authors chose to measure student learning as well as students’ perceptions of their learning and experiences while working closely with a librarian. In order to measure both, the researchers constructed three different methods for collecting data. First, students completed required research journals while searching for articles on their topic. These journals were analyzed to qualitatively examine how the students’ search techniques and decision making regarding what literature to include and what to discard from their searches developed over time. Second, students participated in a single-case, multiple baseline across participants’ research design. This design allowed investigators to systematically identify across multiple points a change in the complexity of the research skills used by the students after receiving the “intervention” of the one-on-one consultation from the librarian. Third, in the spring semester, students took part in a focus group asking them to reflect on their experiences working with a librarian in this class and throughout the course of their graduate program.

Research Journals
Research journal guidelines were developed by the authors and required students to enter information about each search they conducted to find information for their literature review (Figure 1). A template was created to allow students to enter the following information for each search conducted: date, number of search, databases used, keywords used, thesaurus or subject terms used, limiters used (e.g., peer-reviewed, date changes, full text only), and number of results. Three questions were also included in the template: (1) Was your search successful? (yes or no); (2) Think about an article you decided to include. Why did you include it?; (3) Think about an article you excluded. Why did you exclude it?
Students were given a packet containing multiple copies of the research journal template and were asked to complete at least one entry on their own before meeting with a librarian. After meeting with the librarian, students continued to complete the research journals for each search conducted. The completed journals were collected at the end of the fall semester.

In order to organize the qualitative data gathered by the journals, the authors developed an evaluation guide (Figure 2). Preliminary data from the journals verified that students began the applied research course with varied research skills. For example some students who were inexperienced with the library’s interlibrary loan or article-linking system excluded relevant articles by limiting to full-text only in their search strategies and began their searches with superfluous or overly-specific search syntax. This was in contrast to students with more advanced research skills who did not limit to full-text and who were able to identify appropriate key words and subject terms for their research question.
Single-Case Research Design

Single-case designs are used in several areas of research including psychology, psychiatry, education, counseling, drug rehabilitation, and other disciplines in which the subject serves as their own control. Single-case designs are most commonly used on individuals in order to evaluate interventions performed by clinicians or educators. For this project, a multiple baseline across participants was used. Students were divided into three groups consisting of three students in the first group, three in the second group, and four in the third group. Baseline data were kept on the dependent variable which was students’ responses to weekly research scenarios that were posted via the course learning management system. Each scenario described a student searching for articles on a certain topic and the results yielded by the search thus far. After reading the scenario, students were asked to provide as many recommendations as they could to improve the search results of the student in the scenario. Additionally, students were required to provide rationales for each recommendation given. Investigators scored these recommendations and rationales using a rubric (Figure 3). Results from two individual students were graphed (Figure 4).
Figure 3. Research Scenario Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Exemplary = 4</th>
<th>Proficient = 3</th>
<th>Developing = 2</th>
<th>Beginning = 1</th>
<th>Absent = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides four recommendations based on the results in a given scenario.</td>
<td>Provides three recommendations based on the results</td>
<td>Provides two recommendations based on the results</td>
<td>Provides one recommendation based on the results</td>
<td>Provides no recommendation or a partial recommendation based on the results</td>
<td>Provides no recommendation or a partial recommendation based on the results</td>
</tr>
<tr>
<td>Provides an accurate and detailed rationale for each of the recommendations made.</td>
<td>Provides an accurate and detailed rationale for three of the recommendations made.</td>
<td>Provides an accurate and detailed rationale for two of the recommendations made.</td>
<td>Provides an accurate and detailed rationale for the recommendations made.</td>
<td>Provides no accurate or detailed rationale for the recommendations made.</td>
<td>Provides no accurate or detailed rationale for the recommendations made.</td>
</tr>
</tbody>
</table>

Figure 4. Preliminary Findings from the Single-Case Research
After baseline was established for all three student groups, the independent variable of the one-on-one research consultation was applied to the first group between the first and second week of the course while the remaining two student groups were kept in baseline. The independent variable was then applied to the second student group between the second and third week of the course while the third group remained in baseline. Finally, the independent variable was applied to the third group between the third and fourth week. This staggered application of the independent variable across all three student groups allowed for replication of the effects of the independent variable at three distinct times.

Focus Group
In addition to direct measure of student learning using the single-case design, the authors investigated student perceptions of their learning and their relationship with the librarian embedded in the class. The authors anchored the discussion in four guiding topics: 1) personal attention and relationship with the librarian; 2) research skills; 3) coursework; and 4) the use of the research project to model skills related to data collection, analysis, and reporting. From these guiding topics, the authors generated a focus group protocol which is included in Figure 4. A third-party moderator with substantial experience leading focus groups acted as facilitator in order to allow students to speak freely about their experiences with the faculty member and librarian. Nine of the ten original students from the cohort participated in the hour-long focus group that took place at the end of the spring semester. A transcript of the focus group will be coded in order to find major themes of the students’ responses to the questions.

Teaching Opportunities
One unexpected outcome of the study was the ability to model best practices in data collection, analysis, and reporting using the data collected from the students in the fall semester. In the spring, students designed their own instruments, and implemented their own applied research projects. The authors utilized class time to share their process for developing instruments, piloting data collection, organizing and analyzing data, and representing both quantitative and qualitative data from their project. First, students worked in groups to code the qualitative data from sample research journals and were asked to identify themes and how those themes would inform the librarian’s approach to research consultations the next year. The authors also shared e-mail threads carried out early in the spring semester in order to model the process for developing coding rules and establishing inter-rater reliability when applying a rubric to the qualitative data from the single-case research. Finally, the authors used the data developed from the single-case research to explore options for presenting findings in engaging ways. Authors introduced students to several open-source graphing software that extend beyond the basic graphing software offered in more traditional products.

Teaching the research process using a study performed on the students provided a familiar and realistic context for students who were less experienced with the level of inquiry necessary for executing effective applied research. Rather than providing them with examples of research methods from unfamiliar studies, students were able to work in a context of shared understanding of the purpose of the study and deeper connection to the data produced by their own efforts. To assess the effectiveness of this approach to teaching research, students were asked to reflect on the experience during the focus group at the end of the spring semester.

Next Steps
Next steps include continuing to embed one-on-one research consultations with a librarian in the applied research course. It was decided the research journals would be eliminated moving forward as they were too time-intensive for students and did not reveal the anticipated insight into their research process. The single-case research will continue to run in the fall semester using the research scenarios from the previous year in order to compare the data. The authors will also discuss a modified rubric that will not only identify the number of recommendations and rationales given for each scenario, but will also score their complexity and sophistication. Authors will also continue to invite students to participate in a focus group at the end of the spring semester in order to identify themes over an extended period of time.

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Notes


Seeing the Big Picture: Collating User Feedback in an Effective, Sustainable and Practical Way

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Abstract
This paper presents the details of an online tool to help the Bodleian Libraries collate all the feedback they receive from users into a single, searchable location. The tool is designed to be practical and easy to use by any member of library staff, so that the collation of user feedback is both effective and sustainable. The purpose of the tool is to enable the Bodleian Libraries to see the whole picture of how their users view them and to mine existing qualitative data for new assessment activities.

The problem
Obtaining user feedback about library provisions and services at the University of Oxford is not difficult—quite the reverse—as there are myriad ways that a user can share their feelings and opinions. Therein lays the problem. There are around 100 libraries serving students and staff at the University of Oxford, 27 of which make up the Bodleian Libraries system. Just within the Bodleian Libraries there are:

- 38 subject librarians, who receive feedback via e-mail, face-to-face comments and during information skills sessions;
- 28 library committees—one for medical sciences, one for physical and life sciences, one for each of the seven social science libraries, plus one for the division, and 17 for humanities subjects plus one for the division;
- 27 library helpdesks;
- numerous feedback books/suggestion boxes;
- chat logs from the live help service;
- specific assessment projects, e.g., surveys, focus groups;
- university-wide feedback (National Student Survey; Student Barometer); and
- LibQUAL+®

It is important to the Bodleian Libraries to use feedback to identify areas for improvement in the performance of the libraries. However, the devolved management structure of the University of Oxford in general, and the Bodleian Libraries in particular, means that feedback is not shared throughout the organization—it stays within the area that obtained it.

This is a problem, because it is common for individuals to regularly use four libraries: college; departmental/faculty (which may or may not be one of the Bodleian Libraries); one of the Bodleian Libraries; and the online library (wholly provided by the Bodleian Libraries). As most libraries are on the single union catalogue, the user usually has no awareness of demarcation in organization and funding of the different libraries. So an undergraduate may complain to their college librarian about the location of a book in the Radcliffe Science Library (part of the Bodleian Libraries), a professor may suggest at a Bodleian Libraries-run focus group that a particular college (not her own) should purchase additional copies of a set text, or a chemistry doctoral student may comment at the physical and life sciences division library committee about service provision in the Bodleian Library (a humanities library, which they use for its convenient location). There is no systematic way of ensuring that feedback gets to the relevant person to action it.

This has become a pressing issue, because the last two years has seen a culture-shift in the Bodleian Libraries following a path familiar to the assessment community: a move towards evidence-based decision making in all areas, emphasis on the user experience, requirement to demonstrate responsiveness to feedback, and accountability to divisions. Recently, a number of Bodleian Libraries-wide issues have required knowledge of what users think: changes to physical spaces, the digital shift, research data management, and non-print legal deposit legislation. All of this requires a robust corpus of representative user feedback. It is not possible for the sole assessment librarian to undertake specific feedback gathering
exercises for all these questions. In addition, the number of users is small—6,221 academic staff (FTE) and 19,791 students (FTE)—so there is a need to avoid “survey fatigue.” The solution to this is to mine existing feedback data for new assessment activities.

The solution

The problem of how to obtain, organize and disseminate user feedback to those who needed it had a simple answer—catalogue and classify the user feedback received. We are librarians after all! However, in order to be effective, sustainable and practical, the catalogue needed to be as simple as possible so that it could be used by any staff member and fit in to their workflow so that they would use it.

There was no commercial tool available with the appropriate functionality, so one was built in-house. The objectives for the database were as follows.

1. The input form is pre-populated with options so that the library staff member only needs to select one or more as appropriate. This constraining of vocabulary means that feedback on the same topic can be identified and makes it quicker and easier to input data.

2. There are four routes of ingest:
   a. A web form with the feedback copied/pasted or typed in
   b. A web form with a file attached (e.g., for minutes of meetings)
   c. Upload from chat logs (from live online help)
   d. Export from SurveyMonkey

3. There are three levels of user:
   a. Inputter, who is only able to view all the items they have added (e.g., a library assistant at a helpdesk)
   b. Reviewer, who is able to view and edit all items relevant to a specific area (e.g., a librarian-in-charge or subject librarian)
   c. Master, who is able to view and edit all items, produce reports and output data (e.g., service head)

4. The search function provides a faceted search, including a date restriction, to enable mining on any one or more criteria about the person providing the feedback, or the subject of the feedback (e.g., “What feedback do history undergraduates have about study space provision?”). “Everything about the Social Science Library.”

5. The search function also provides a free text search of the feedback, and the results of either faceted or free text search can be exported as a spreadsheet.

Input

The individual who receives the feedback enters it into the system and then indexes it.
Add new feedback

Faculty subject
- African Studies
- Anthropology
- Archaeology
- Art & Architecture

Card types
- University card (internal)
- Reader Card (external)
- No Card

User types
- Undergraduate
- Research Postgraduate
- Academic staff
- Researcher

Areas of issue
- SOLO
- Library staff
- User education
- BSF / deliveries

Libraries
- Radcliffe Science Library
- Rewley House Continuing Education Library
- Rhodes House
- Sackler Library

Mode of feedback

Feedback text

Feedback file

Date of incident: 2014-08-01

Submit  Clear
There are eight input fields pre-populated in the web form: faculty or subject; card type (whether they are a member of the university or an external reader); academic level (undergraduate, taught postgraduate, research postgraduate, academic staff); what the feedback is about; how the feedback was received (library committee, e-mail, comment at desk, etc.); and the text of the feedback—either typed or cut-and-pasted into the box, or uploaded as a file. The date is automatically entered as today, but this can be changed if reporting feedback is received at a different time. There is no limit to the number of index tags that can be selected for each piece of feedback.

The options for each of these fields was agreed upon collectively by the anticipated major user group (subject librarians) as being meaningful and useful, balancing specificity with list length. It is anticipated that options will be added as new areas of feedback emerge.

**Review**

As the data will be used for multiple future assessment activities, it is critical that the classification of the feedback is accurate. Therefore, the database includes a review function. This serves two purposes. Firstly, once the person inputting the information has submitted it, they are taken to a summary review of that entry, enabling them to immediately amend any inputting errors. Secondly, a “reviewer” is able to view all entries made by a particular group of staff and amend them, if required. For example, a student has tried to borrow a reference only book, then complained at the circulation desk because they want to be able to use it at home. The staff member on the desk logs this feedback, and classifies the area of issue as “stock.” The librarian-in-charge in reviewing this week’s entries recognises that this feedback would be useful when investigating the demand for e-books and amends the record to include “e-book” as an additional area of issue tag.

**Output**

The database can be searched by one or more index tags in the faceted search, or via full text search of the feedback. The results are presented in tabularised form and the full text of the feedback is accessible in two clicks. The results can be exported into Excel for further manipulation.

All of the input fields can be used, singularly or in any combination, to undertake a faceted search. For example, selecting “research postgraduate” as user type and “opening hours” as area of issue:

<table>
<thead>
<tr>
<th>Faculty Subject</th>
<th>Card Types</th>
<th>User Types</th>
<th>Area of Issue</th>
<th>Libraries</th>
<th>Mode Of Feedback</th>
<th>Date Of Incident</th>
</tr>
</thead>
<tbody>
<tr>
<td>US studies</td>
<td>University card</td>
<td>Research Postgraduate</td>
<td>Opening hours</td>
<td>Vere Hamsworth Library</td>
<td>Person</td>
<td>01/08/2014</td>
</tr>
<tr>
<td></td>
<td>(internal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>University card</td>
<td>Research Postgraduate</td>
<td>Opening hours</td>
<td>Education Library</td>
<td>Library Committee</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(internal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td>University card</td>
<td>Research Postgraduate</td>
<td>Opening hours</td>
<td>Radcliffe Science Library</td>
<td>Feedback form/book (web or paper)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(internal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African Studies</td>
<td>University card</td>
<td>Research Postgraduate</td>
<td>Opening hours</td>
<td>Latin American Centre Library</td>
<td>Library Committee</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(internal)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Selecting one of the results takes you to the details of that feedback item, for example:

### Feedback item 16

**Content**

- Bodleian Libraries SOLO User Group
  - 4th February 2014, 11am

Minutes

1.  **AOB**

a) LO raised a Reader Services issue that often arises when students are renewing a few books online, but when they hit the fines limit, say after just a couple of books, it stops renewing. This is currently not very obvious so students assume they have retrieved everything successfully.

ACTION: AM to investigate

(no file)

---

**Classification**

- **Faculty subject**
  - Medical sciences

- **Card types**
  - University card (internal), Reader Card (external)

- **User types**
  - Taught Postgraduate, Research Postgraduate, Academic staff, Researcher

- **Areas of issue**
  - SOLO

- **Libraries**
  - Cairns

- **Mode of feedback**
  - Department/Faculty/Subject committee or meeting

- **Date of incident**
  - 30 Jul 2014

---

If a file had been uploaded instead of entering text in the box, clicking on the name (where [no file] is indicated in the example above) would open the document.

**Reception and future developments**

The database has been very warmly welcomed by both the Bodleian Libraries senior management team and by the subject librarians management group. Usability testing elicited an extremely positive response from individuals, with all commenting on how easy it was to use. It is going to save the assessment librarian a great deal of time.

Immediate next steps are to roll out the database to all frontline staff to input feedback and to link it directly to an online feedback form, to avoid double keying. Future developments include implementing all the input forms, i.e., uploading from chat logs and importing from SurveyMonkey.

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What’s it Worth? Quantitative Assessment of E-Resources by a National Consortium

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University of Toronto and Canadian Research Knowledge Network, Canada

Sabina Pagotto
Canadian Research Knowledge Network, Canada

Abstract
The Canadian Research Knowledge Network (CRKN) is a partnership of Canadian universities, dedicated to expanding digital content for the academic research enterprise in Canada. The economic and scholarly publishing context faced by Canadian university libraries today is very different than the context that existed in 2000 when the network was conceived as a pilot project. The consortium and its members are facing decisions about how best to achieve sustainably funded library collections that effectively support the research and teaching needs of Canadian institutions. To support this decision making, CRKN has adapted the quantitative assessment model established by the California Digital Library (CDL), and is working to assess thousands of licensed titles, at the aggregate and individual institution level, based on their quality, utility and cost-effectiveness. The goals of this project are to ensure that the consortium is devoting resources that represent the best possible value to participating institutions, and to provide a mechanism by which institutions can evaluate their own titles if the decision to exit a big deal is made. This paper will describe how CRKN adapted a simplified version of the CDL’s method, allowing for the establishment of an assessment program using existing resources. The paper will highlight the technological, human, and knowledge resources that were needed to put an assessment program in place and provide an overview of the process by which the program was established. Lastly, the paper will highlight two cases when a quantitative assessment of licensed resources was applied: to the cancellation of a low-value package for the consortium, and for decision support by a member institution returning to a title-selection model when a big deal was no longer affordable.

The need for quantitative assessment of library collections is two-fold: to ensure that libraries are devoting resources to titles that represent the best possible value to users, and to provide a mechanism by which libraries can evaluate their titles if the decision to exit a big deal is made. Individual libraries, and increasingly, consortia that license materials on a large scale, carry out quantitative assessment of library collections. Electronic resource assessment can be labour intensive and a lack of resources and staff time can be used as an argument against establishing an assessment program. The Canadian Research Knowledge Network (CRKN) has established a program to leverage existing resources for big deal package assessment. Established in 2000, the CRKN is a partnership of Canadian universities dedicated to expanding digital content for the academic research enterprise in Canada. Representing seventy-five Canadian university libraries, CRKN negotiates the purchase and licensing of digital content from academic publishers. The organization was established with $20 million in federal funding and matching provincial funds to purchase or provide access to electronic journals and citation databases. Once the government funds were expended universities wishing to retain access to licensed resources had to pay licensing costs from library budgets. CRKN has continued to negotiate content licenses on behalf of Canadian university libraries: leveraging buying power for new content purchases, securing favourable license terms, and working to lower annual increases.

Purpose
The consortium and its members are facing decisions about how to best achieve sustainably funded collections. The Association of Research
Libraries (ARL) has reported that within North American research libraries since 1986, the cost of serials has increased at double the consumer price index (CPI). Since 2009, CRKN members have expressed a strong interest in receiving tools from the organization to help make collections decisions and content selections—specifically usage statistics and tools to assess the financial impact of collections. The majority of CRKN members participate in a core offering of big deal packages from vendors including Elsevier, Springer, Wiley-Blackwell, Taylor & Francis, and JSTOR. The size of these packages and the three-year license agreements negotiated by CRKN mean that members commit a large portion of their budgets to CRKN-licensed resources. While consortia arrangements provide added value in resource licensing or purchasing, this value has at times not been enough to allow libraries with serious budget shortfalls to maintain all licensed resources. The impacts of big deal arrangements on library budgets have long been criticized in the academic library community. The global economic crisis exacerbated this criticism and the assessment program is a key tool in addressing questions of collections priority in changing financial circumstances.

Large university systems including the University of Oregon and the University of Colorado have undertaken quantitative reviews to measure return on investment or make usage-based collection decisions for big deals in recent years. The California Digital Library, part of the University of California system, is undertaking a comprehensive value measurement for consortia purchasing of digital content. The CDL program uses objective measures to compare the value of scholarly journals licensed by the library. CDL’s program developed a value-based strategy as a part of their journal collection planning process. The strategy uses objective metrics on measures of utility, quality, and cost-effectiveness. A numerical score is assigned to each journal title for each of these measures depending on whether the value for each metric is above or below the median for that subject. CDL is working towards assessing 9,000 journals in 36 packages and assigning each journal a numerical score to allow for comparison with other journals in subject groupings.

Overview
Single License Pilot
To effectively support the research and teaching of Canadian university libraries, CRKN made the decision to establish a quantitative assessment model for national licensing activities, based on the work done at the CDL. CRKN had access to no additional human or financial resources for the purpose of an assessment project so made the decision to test a modified version of the CDL’s method on one big deal journal package. The package of journals licensed from Wiley-Blackwell was chosen for the pilot as it is multidisciplinary, contains about 1,400 journals, and is licensed by 69 of the 75 CRKN members. For most members, the Wiley-Blackwell package is one of their top three journal packages in terms of annual expenditures. For the purpose of the pilot, eight member institutions were selected as broadly representative of the CRKN population. Data was collected in the areas of quality, utility, and cost-effectiveness based on the CDL model.

Journal quality was established using Impact Factor and Source Normalized Impact per Paper (SNIP). The utility of journals was measured using full-text article requests from a JR1 COUNTER report and the number of publications by faculty at the institution in each journal between 2007 and 2011. CDL’s method relied on number of citations of each journal by institution faculty for the second utility measure but this figure was not readily available to CRKN. Cost-effectiveness was measured using cost-per-use and cost-per-SNIP for each title. To measure cost-per-use, the cost of each title, for each member first had to be determined. The major discrepancies in institution size, and by extension package cost, made it necessary to devise a way to consider costs that reflect the list prices of the journals and the sizes of the institutions. The adjusted cost of each title was calculated by determining the percentage of each journal’s cost within the total journal package. The vendor list price for each title was recorded and then the list prices for all titles in the package were added together to produce a total package price. For each title, list price was divided by the total package price and then multiplied by the package cost paid by each institution. This method of calculation considers differences in list prices of journals and in costs paid by individual institutions.

Once data was collected, each of the six data points—SNIP, impact factor, usage, faculty
publications, cost-per-use, and cost-per-SNIP—for each institution was sorted into quartiles. CDL’s algorithm was applied to the quartile values to assign an overall numerical score to each individual journal title. To understand how the pilot could be translated into a larger scale project, CRKN staff, the board of directors, and content strategy committee, a group of collections librarians and library directors from across the country, reviewed the results.

**Three License Project**
The reviewers examined the data that had been gathered and decided that data collection would require simplification if the project was to move forward with existing resources. In the area of journal quality, CRKN retained only SNIP, since SNIP scores could be retrieved freely as a CSV file from [http://www.journalmetrics.com/index.php](http://www.journalmetrics.com/index.php). SNIP is also normalized by subject so would allow for apples-to-apples comparisons of journals in multidisciplinary packages. It was also decided that journal usage would be the only factor used to decide journal utility, since gathering faculty publication information for each journal for each institution was too time consuming. Faculty publication and citation information can be exported from products including InCites, but CRKN did not have the financial resources for this product, nor the human resources to gather the data manually.

Project staff also made the decision to move away from the use of multiple Excel spreadsheets for data management. Several options were reviewed including the Ontario Council of University Libraries (OCUL)’s Scholars Portal Usage Data (SPUD) portal and the Jisc Journal Usage Statistics Portal (JUSP). While both systems are user-friendly and useful for the storage and analysis of usage data, neither system was robust enough to store pricing data and make the calculations required for the project. It was decided that the project would go forward using a Microsoft Access database with no web component.

Having made decisions about the modification of the project and after gathering feedback from key stakeholders, a three license project was initiated to provide data on three big deal licenses scheduled for renewal in 2014 to all 75 member libraries. Data was collected for three big deal licenses accounting for approximately 5,000 journal titles. Unique pricing and usage data was needed for every journal for every subscribing institution, meaning more than 700,000 lines of data were needed. The majority of the work involved in the assessment project came at the outset: designing the database, standardizing inputs, and creating report templates. CRKN received a small grant from the Canadian Young Canada Works project that allowed the organization to hire a recent library school graduate for a 16-week work term. It is estimated that the intern spent eight weeks of work on the assessment project. With the templates that were created, it is estimated that it will take two weeks of staff time per year to input data and create reports.

The data inputs for the project were drawn primarily from CRKN files, supplemented by COUNTER JR1 reports from journal publishers and SNIP information that was freely available online. The following sets of data were entered into an access database for each of the three big deal packages: journal title list, journal subject list, journal price list, journal SNIP, COUNTER JR1 reports for each subscribing institution, and subscription cost details for all subscribing institutions. The standardization of COUNTER reports and of CRKN’s internal pricing worksheets simplifies data input and allow for “one-click” import of usage and cost data. Publisher price lists and subject sheets lack this standardization meaning manual manipulation of Excel spreadsheets by a staff member is often necessary before data can be input into the database.

Once the data input was complete a series of report templates was made so that reports could be auto-generated for each institution when data was updated. Two report types were created: a PDF dashboard with high-level information for use by administrators and a title-level Excel spreadsheet for use by library collections staff. The administrator dashboard includes charts and graphs showing: expenditure by subject, expenditure by publisher, titles with no use, low use, medium use, and high use by publisher, use by subject, use by publisher, percentage of publisher title in each JVM value range, cost-per-use by subject, and cost-per-use by publisher.

The library collections spreadsheet was meant to allow collections staff to perform their own analysis using the data provided. One tab included
institution-specific information, the other included CRKN aggregate information. The following data fields are provided: ISSN, title, vendor, subject, SNIP, list price, cost, usage, cost-per-use, and JVM score. The spreadsheet allowed collections librarians to re-sort data in a way that best serves local needs and answers questions about collections decisions with specificity and guided by data.

Data for the three license pilot was distributed in 2013 alongside a request for feedback from collections librarians and library directors at each institution. The answers to the surveys were used to inform changes to the design of the dashboards and spreadsheets and the modified version assessing a further three licenses was sent to the 75 institutions in 2014.

Cases
Swets ALJC
While working to prepare the assessment project, CRKN was met with the opportunity to use the data that had been gathered and the expertise that had been acquired for decision making about a big deal license. In 2013, after collecting pricing and usage data for a large group of licenses, CRKN began closely examining the Swets ALJC package of close to 1,000 titles. The ability to use hard data to compare the Swets package to other Big Deal journal packages allowed CRKN staff, board members, and libraries to determine that the package’s cost per use and titles with zero use were not acceptable when compared with other packages. In September 2013 a decision was made not to renew the national license.13

Université de Montréal
Because of a major budget reduction the Université de Montréal had no choice but to terminate the next big deal package that came up for renewal: Wiley Blackwell. UdeM used the data provided by CRKN as part of their strategy to identify titles that they should continue to access via individual subscriptions.14 Given the opportunity to apply the JVM project to a real scenario, UdeM expressed concerns that the use of SNIP, even though it is subject normalized, disadvantaged the social sciences and humanities. As such, UdeM excluded that part of the analysis. The university is currently undertaking a bibliometrics research project to attempt to find an algorithm that more evenly addresses the needs of social sciences and humanities scholars. The hope of CRKN is to work that research into future analyses.

Findings
CRKN collected feedback from member libraries at every stage of the project. The top piece of feedback received was the discomfort of librarians with the usage of SNIP or other measures of journal quality. The inclusion of a quality ranking in the algorithm was thought to be important by project staff, even if there was not wide agreement about what that quality ranking should be. In one journal package surveyed, the overall distribution of the journal package placed about 40 percent of titles under the social sciences and humanities (SSH) heading and about 60 percent of titles under the science, technology, and medicine (STM) heading. The top 100 titles as determined solely by usage placed 14 percent of titles under the SSH category and 86 percent of titles under STM. Using the JVM calculation, which included SNIP to determine the top 100 titles, about 40 percent of titles came under the SSH heading, and around 60 percent under the STM heading. The close relationship between the subject distribution of journals in the pilot study and the overall distribution of journals in the package suggests that a multifaceted approach, while labor-intensive, helps to ensure that “valuable” means more than “high-use.”15 Librarians either were not familiar enough with SNIP to be comfortable using it or they did not think SNIP did enough to normalize impact and prevent SSH journals from being disadvantaged. For the next release, project staff calculated the median SNIP for journals in a subject area and adjusted the formula to show if a journal was above or below the SNIP for its subject area—in effect normalizing for subject twice. Individual libraries are free to include or exclude quality figures when evaluating journals at the title level in the provided spreadsheet.

Second only to the feedback about SNIP was the discomfort expressed with the idea that a title can have zero use and score higher than zero in the value equation. The library community believed that if a title has never been used at their institution it has no value to them, regardless of its quality or price. With that in mind project staff modified the equation so that any title with zero usage will automatically receive a zero score. The library community also expressed the desire to benchmark themselves against their peers. In
In order to understand the values and scores, libraries wanted to be able to compare titles and packages with one another, but also to understand how much value they were deriving from a given title or package compared to other universities. This was countered by the desire of other libraries to keep their own data private. As a solution, CRKN applied a ranking system, putting universities in eight tiers based on their size. Universities receive their own data as well as aggregate data for their tier. This allows them to benchmark but also ensures privacy for individual schools. Lastly, the libraries expressed a desire to differentiate their core titles within each package. CRKN staff determined that vendor cooperation would be necessary in order to add this data in a time-effective manner, and a solution has yet to be devised.

Conclusion
Since 2009, CRKN members have been asking for tools to collect usage statistics and assess the financial impact of collections decisions. With access to data for 75 universities, and access to expertise from libraries all over the country, CRKN was uniquely positioned to provide such a tool. The main asset leveraged was expertise. The consortium enlisted the help of assessment librarians at member universities and at other consortia and utilized the database and financial expertise of existing staff. CRKN’s initial assessment pilot used citation indices and the organization later considered investment in web-based tools for data storage and analysis. The final decision of CRKN’s board was to build an assessment tool using existing data and existing tools. The majority of work was done through Microsoft Access and used data either already on file or freely available. Time is still the greatest resource used in the assessment project but human resources needs were greatly reduced by using a grant for a student employee who was responsible for creating the database and templates for use in future years. Work is conducted by existing CRKN staff. These considerations allowed CRKN to quickly implement an assessment program in response to member needs and will allow the organization flexibility to modify that program as needs change.

Endnotes


Assessment of the Usage of Electronic Resources at the University of Massachusetts Amherst: A MINES for Libraries® Study using Tableau Software for Visualization and Analysis

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Abstract
This paper presents the findings of the second yearlong assessment of electronic resources at the University of Massachusetts Amherst, using the ARL MINES for Libraries methodology. MINES is an online, transaction-based, point of use, intercept, web survey methodology that collects data on the patrons’ purpose of use of electronic resources and on the demographics of users. The University of Massachusetts implemented MINES twice, in 2008–2009 and again in 2013.

The paper will discuss the two implementation methods for the MINES point-of-use, intercept survey launched at the EZproxy server:
1. Randomly chosen two-hour sessions
2. Every Nth user methodology

The technical aspects and the reliability and the validity of these two methods are compared. The paper reports on the data results of the recent survey, examining user demographics, time and date analysis, location of use, purpose of use, and collection development implications.

We show how using Tableau Software, a data analytics and visualization application, to interact with the survey data helped to:
• review and use live data throughout the year to monitor the projected total results making adjustments in real-time;
• compare the distribution of sampled e-resources to all the usage of e-resources to judge the reliability of the sample;
• present a more informative visual display over SPSS and Excel graphics revealing relationships more easily; and
• collect survey data continuously, run the survey for the foreseeable future, and consider expanding the survey scope to include other resources.

Finally, the paper shows how data collected about users including status, academic affiliation, and purpose of use can augment and enrich COUNTER data to give a more complete, deeper picture of electronic resource usage.

Introduction
As academic libraries spend an increasing amount of their budget on electronic resources, librarians seek to find out who is using the electronic resources and why. One tool is COUNTER that sets standards for recording and reporting usage of networked electronic resources. From COUNTER compliant data usage reports from subscribing vendors, libraries receive the number of successful full-text article requests by month and journal, total search requests by platform or database, successful section requests by e-book, and various title request reports among other reports. As described by Emery and Stone, there are a number of tools for analyzing COUNTER data in addition to those in the electronic resource management system, including vendor supplied applications like ProQuest 360 Counter, EBSCO Usage Consolidation, and consortial tools like Journal Usage Statistics Portal. With these data and tools, performance indicators such as downloads per FTE user, cost per search, cost per view, cost per FTE user, and other metrics can be generated.
However, as Marcum and Schonfeld note, as useful as the COUNTER compliant activity counts are for library usage data and performance statistics, more granular data on individual users’ activities can afford greater opportunities to analyze needs and develop or optimize services. But considerations for user privacy can make librarians uncomfortable with such granular data, which has to some degree impeded our ability to establish the types of personalized services that are skyrocketing on the consumer internet.\(^8\)

This paper presents a complementary methodology to COUNTER, giving the greater granularity while maintaining user anonymity and privacy. Reported here are the findings of the second, yearlong, assessment of electronic resources at the University of Massachusetts Amherst, using the ARL MINES for Libraries methodology.\(^9\) MINES is an online, transaction-based, point of use, intercept web survey methodology that collects data on the patrons’ purpose of use of electronic resources and on the demographics of users. This methodology helps to measure the impact of library services and to identify opportunities to serve faculty and students more effectively, which as Marcum and Schonfeld note are the desired goals for assessment.\(^8\) The MINES data gives a picture of users and usage that does not replace COUNTER data but gives a more complete and deeper picture.

The University of Massachusetts implemented MINES twice, in 2008–2009 and beginning in 2013. This paper compares two implementation methods for a point-of-use, intercept survey launched at the EZproxy server: (1) randomly chosen two-hour sessions and (2), an every Nth user systematic methodology. The 2008–2009 survey used 24 two-hour time blocks spread over 12 months to survey users of e-resources (primarily e-journals and databases). The 2013–2014 implementation, which for the purposes of this paper closed June 30, 2014, surveyed every 140\(^{th}\) usage passing through the proxy server. The paper compares the two methods for reliability and validity of the results and ease of technical implementation and reports on the results of the recent survey, examining user demographics, time and date analysis, location of use, purpose of use, and collection development implications.

Further, this paper demonstrates how using business intelligence software for data analysis and visualizations\(^11\) to interact with the survey data in real time helped to:

- review and use live data throughout the year providing the ability to monitor the projected total results to make adjustments in real time. The survey frequency was increased from every 200\(^{th}\) user to every 140\(^{th}\) user to collect sufficient data to answer collection development research questions;
- compare the distribution of sampled e-resources to all the usage of e-resources to judge the reliability of the sample;
- present a more informative visual display over SPSS and Excel graphics revealing relationships more easily and clearly; and
- collect survey data continuously, running the survey for the foreseeable future, and consider expanding the survey scope to include other resources.

Finally, the paper shows how data collected about users including status, academic affiliation, and purpose of use creates a deep picture of usage that can be combined with COUNTER data to give a more complete picture of electronic resource usage.

MINES for Libraries

As described on the Association of Research Libraries web site, [http://www.minesforlibraries.org/](http://www.minesforlibraries.org/) MINES stands for Measuring the Impact of Networked Electronic Services and is an online, transaction-based intercept survey that collects data on the purpose of use of electronic resources and on the demographics of users. MINES was adopted by the Association of Research Libraries (ARL) as part of the New Measures toolkit in May 2003. It is a point-of-use web survey of three to five questions that integrates usage data about electronic resources such as digital collections, open access journals, pre-print and post-print servers, and institutional repositories, to give an inclusive picture of the library’s supported networked electronic resources.

In general, MINES for Libraries aims to:

- measure the value and impact of digital content;
- determine how specific user populations apply digital content to their work, based on demographic and purpose-of-use analyses;
• identify where library use originates in the networked environment and tailor services accordingly; and
• gather digital collections use data to justify increased funding for digital content and to make informed collection development decisions.

The roots of MINES are in indirect cost or facilities and administrative (F&A) cost studies focused on the library to help universities provide evidence for determining an accurate infrastructure support cost associated with sponsored research. These cost analysis library studies have been administered since the early 1980s, although the web surveys have been in use since 2000. In addition to the web survey, the MINES methodology can also be used to assign a monetary value to a cost center in the academic library, such as a class or materials like e-journals or to specific vendors such as Elsevier’s ScienceDirect to determine the portion of the cost center dedicated to the support of funded research, instruction, patient care, public service, and other activities by different classes of patrons of the library.

MINES employs a web-based user survey intercept methodology that delivers a short survey at the point of use of an e-journal, database article, or digital collection or service. There are two research designs or sampling techniques recommended by MINES, both of which result in a random sample of patron usage of networked electronic resources, the distributions of which can be applied with confidence to the user population. Note that in both cases the survey is a usage survey, not a user survey. MINES attempts to represent usage in the survey sample.

1. Random Moment Sampling
In the random moment sampling method for each month over a year either one or two two-hour survey sessions are randomly chosen for administering the web survey. The web survey then intercepts usage over that sampled period, querying the patron at the first usage of a surveyed resource, and repeatedly copying the values of the survey to a database at every subsequent use of surveyed resources by the patron during that two hour period, adding a new time/date stamp and target URL or the URL of the surveyed resource. Currently, this sampling technique is employed for the cost analyses studies to determine F&A rates, and not for the ARL supported MINES studies. The strengths of this sampling technique are:
   a. The users are intercepted only 24 or 48 hours over a year, so the annoyance index is low.
   b. The number of records collected is usually sufficient to analyze usage by cost center.
   c. The data are collected at a common point, and therefore are commensurable (like COUNTER compliant data) across diverse networked electronic resources.
   d. The survey collects data in a manner consistent with how patrons seem to use resources, that is, patrons often conduct a literature search intensely for a short period. The two-hour survey session tracks this burst of searching activity.
   e. The sample is random.

The weaknesses of this sampling technique are three-fold:
   a. The intercept survey is intrusive.
   b. To log usage over a two hour period the technologist must set up a session for the patron’s browser that will remember some token for the patron over the two hour period. The session is usually established with browser cookies or a server-side session. Although there is no identifying information associated with the patron, it is important to this technique that the survey session knows the patron is still the patron.
   c. Depending on the intercept point, described in following paragraphs, the survey session may be more or less difficult to implement.

2. Systematic Sampling
With this sampling technique every Nth usage is sampled at some choke point or virtual gateway, such as OCLC’s EZproxy (OCLC 2014) or an open URL link resolver, e.g., ExLibris SFX. The systematic sampling is an equal probability method within the ordered sampling frame and is often referred to as an every Nth sample. With this technique, an N is established and the starting point is randomly chosen. In libraries that have administered an every Nth sample, N has ranged from 1:500 to 1:140. Like the random moment sample, the every Nth data collection is over a year to capture the different states of academic library usage: the academic year, the summer, and intersessions. The second Ontario Council of University Libraries study by ARL, OCUL, and the University of Toronto is a systematic sample for the 20 libraries involved with the study. ARL currently recommends this sampling method for MINES implementations.

The strengths of this sampling technique are:

a. the N can be changed to increase the number of records collected or to reduce the annoyance;

b. the most difficult part of the technical implementation for the random moment sample, that is, the creation of the session, is eliminated, so that the every Nth sample is technically easier to set up than the random moment sample;

c. the data are collected at a common point, and therefore are commensurable (like COUNTER compliant data) across diverse networked electronic resources; and

d. the sample is random.

The weaknesses of the systematic sample are:

a. The intercept survey is intrusive.

b. The every Nth sampling does not reflect patterns of heavy usage and light usage by individuals in the same manner as the two hour session, although heavy users are likely to be surveyed more often over the year than light users.

c. Depending on the intercept point, described in following paragraphs, the survey session may be more or less difficult to implement.

The intercept point for MINES should be some virtual gateway through which most users choosing a networked electronic resource must pass. Because the MINES survey methodology is based upon capturing the target URL or selected networked electronic resource, open access resources not included in the library’s electronic resource management system, bookmarks that do not include the proxy prefix, password-based alerting services, any services that depend on vendor passwords rather than some library mechanism, or e-books downloaded to e-readers are all problems for the MINES survey methodology. The intercept must be done locally at the library’s web services, unlike LibQUAL+® where the survey is accessible through the ARL platform. Libraries have implemented MINES with different techniques and gateways, such as prepended Java, php or JavaScript redirects from a list of resources, a survey intercept at the proxy rewriter such as EZproxy, or a survey intercept at the open URL link resolvers such as Ex Libris SFX, Innovative Interfaces’s WebBridge LR, and ProQuest’s 360 Link. The SFX solution is described by Thomas and others. One version of an EZproxy solution has been written up by Reese. One of the advantages of the EZproxy implementation is that resources and services can be placed behind the EZproxy application, and therefore can be surveyed. For example, PubMed is often not behind the EZproxy server since it is a free resource. However, many libraries wish to include PubMed as a surveyed resource, in part because of its LinkOut feature. Then it can be added to the EZproxied resources. In many cases the surveyed resource could be added as an open URL link resolver target also. In another common technique networked service that will increase the validity of the sample, the technology group at university campus can push out the appropriate library access links (open URL link resolver) within Google Scholar to browsers on campus, thus increasing traffic to the link resolver and the proxy server if one is used, tightening up the web of possible survey points. The most comprehensive interception point is at the Internet service provider router for the university, and as radical as it may seem, this router based solution has been implemented twice by at least one university and has been contemplated by several others. The router based solution has the fewest limitations, but the other intercept points also work well, and collect reliable samples, as long as the limitations are understood.

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University of Massachusetts Amherst
environment and implementation
The University of Massachusetts Amherst is a public research university offering undergraduate, graduate, and professional degrees. There are 28,518 undergraduate and graduate students, and 1,170 full-time instructional faculty. The UMass Amherst Libraries is the largest state-supported academic library in New England with over 8 million items, spending $6 million on continuing e-resources.

The UMass Amherst Libraries implemented MINES twice, once using the two-hour random moment sample design in 2008–2009, and then the every Nth sample design in 2013–2014. The first survey ran for 12 months, from September 2008 to August 2009 with two two-hour survey periods per month. Figure 1 is a screen shot of the survey.

Figure 1

Because of technology limitations, the survey had to be manually turned on and off at the EZproxy server for each survey period. The help desk survey support changed from daytime to evening and the survey form was updated to reflect the changes each survey period. There were 4,396 completed surveys that were linked to URLs in the proxy log. The BioStatistics Consulting Group at the university ran the analysis on the data in SPSS, producing useful data but in the standard ASCII SPSS tabular format. These data were then reworked by library staff in Excel generating pie charts and cleaner tables. Figures 2a and 2b show how the visual presentation appeared.
The highlights from this study were that most of the users of networked electronic resources are not physically located in the UMass Amherst Libraries; there were a surprising number of undergraduates involved with research; and the libraries documented its contribution to the sponsored research endeavor as well as to teaching and learning.

In 2013, the UMass Amherst Libraries implemented the MINES survey with the every Nth (N=140) systematic sample design. A Perl script with rules for presenting the survey was invoked using the EZproxy service banner redirect setting. The data was collected in a MySQL database, and live Tableau software connections were used to analyze and visualize the results. Figure 3 shows how the survey intercept works.
In this survey an abandonment reduction factor was included, making the survey more valid. Once the patron browser request was intercepted and the survey launched, the patron had five minutes to complete the survey. If the patron did not complete the survey in that time, then the survey timed out. A multi-step intercept calculation accounted for expired surveys and maintained the desired 140th user rate of return. The median time to complete the survey was 45 seconds (five minutes was the maximum allowed); the fastest survey was completed in 12 seconds. Figure 4 shows the survey completion time distribution in seconds. The overall response rate was 71%.

Tableau Software
Although Excel has its advocates for the analysis of the usage of electronic resources in libraries, we used Tableau Software for analysis and visualization in the second iteration of MINES at UMass. Tableau Software is a business intelligence tool designed for data visualization and analysis.
software that can be used for data analysis and interactive data visualization. It is increasingly popular in analyzing library usage statistics. With Tableau, data results can be monitored in real time. Monitoring the results in real time proved useful because early in the study it was observed that an N of 1:200 was not collecting sufficient data to lead to reliable and valid results. With N at 1:200, 3,477 surveys would have been collected over the year, fewer than the 2009–2010 survey. By adjusting the N to 1:140 at the end of the first quarter roughly 5,035 records were collected.

Tableau compared the data collected at the Nth use with the data collected for all use at the proxy server to confirm that the distributions were indeed similar and the sample was a representative sample of the population of all EZproxy use. This validity analysis was done on the frequency distribution of web surveys by hour during the day compared to all EZproxy usage and the frequency of usage by month (see Figures 5a and 5b). As can be seen by inspection, the distributions are almost identical.

**Figure 5a. Hourly MINES Survey and All Proxy Traffic**
Using dashboards to display survey results visually helped the staff absorb and understand the survey results. The side-by-side presentation makes it easier to see relationships between responses within a single holistic view. The MINES User Group Dashboard (see Figure 6) shows the summary of all results. This broad overview provides the baseline for deeper analysis. For example, it is useful to see that 89% of overall use occurs outside the library buildings and that 53% of use was in support of teaching or classwork. Visualizing MINES data with Tableau increases utility because the data is easily filtered to answer a range of detailed questions posed by individual staff. A liaison librarian to engineering can see that 92% of graduate student use happens outside the library and that 45% of use is for thesis or dissertation work (see Figure 7). This kind of close analysis of the questions informs instruction, outreach, and support to constituents. The power comes not only from aggregate data or from a single conclusion but also from the ability to understand specific and integrated aspects of the data as needed for various purposes.
Figure 6. Dashboard Summary Overview

MINES User Group Dashboard

User Status
- Undergraduates: 44% - 56%
- Graduate: 55% - 45%
- Faculty: 14% - 86%
- Staff/Facilities: 87% - 13%
- Total: 100%

Location by User Group
- On-campus: 36% - 64%
- Off-campus: 64% - 36%
- In Sel: 54% - 46%
- In the W.E.B Du Bois Library: 46% - 54%
- Total: 100%

Purpose by User Group
- Coursework & Teaching: 46% - 54%
- Research: 54% - 46%
- Other: 8% - 92%
- Total: 100%

School and College by User Group
- Natural Sciences: 44% - 56%
- Social and Behavioral Sciences: 55% - 45%
- Business: 14% - 86%
- Other: 8% - 92%
- Total: 100%

Why Did You Choose this Resource by User Group
- Important resource in my area: 60% - 40%
- Encouraged by professor: 50% - 50%
- Course requirement: 40% - 60%
- Library catalog: 60% - 40%
- Reference or citation from peer: 30% - 70%
-聞いたりも見たりも: 8% - 92%
- Recommend by librarian: 10% - 90%
- Additional: 5% - 95%
- Total: 100%

Figure 7. Location and Purpose of Use Filtered by Graduate Students in Engineering

Location by User Group - Graduate Students in Engineering

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off Campus</td>
<td>88 - 60%</td>
</tr>
<tr>
<td>On campus but not in Du Bois or SEL</td>
<td>46 - 32%</td>
</tr>
<tr>
<td>In SEL (Science and Engineering Library)</td>
<td>6 - 4%</td>
</tr>
<tr>
<td>In the W.E.B Du Bois Library</td>
<td>6 - 4%</td>
</tr>
<tr>
<td>Total</td>
<td>746 - 100%</td>
</tr>
</tbody>
</table>

Purpose by User Group - Graduate Students in Engineering

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Number of Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thesis or Dissertations</td>
<td>65 - 45%</td>
</tr>
<tr>
<td>Sponsored (Funded) Research</td>
<td>36 - 25%</td>
</tr>
<tr>
<td>Coursework</td>
<td>29 - 20%</td>
</tr>
<tr>
<td>Non-Sponsored or other Research</td>
<td>8 - 5%</td>
</tr>
<tr>
<td>Other</td>
<td>7 - 5%</td>
</tr>
<tr>
<td>Teaching</td>
<td>1 - 1%</td>
</tr>
</tbody>
</table>
Finally, one of the most interesting comparisons made using Tableau was to ingest COUNTER data into Tableau for the Web of Knowledge both for record views in the database and regular searches (see Figure 8).

**Figure 8. COUNTER data for Web of Knowledge displayed by Tableau**

![COUNTER data for Web of Knowledge displayed by Tableau](image)

The COUNTER data is useful but does not give the granularity of MINES data for the same resources. See Figure 9, which shows Web of Knowledge use by user type, purpose, school and college affiliation, the purpose of use, and the reason why the resource was selected.
At a glance it is easy to see that graduates students are the largest category of users and that it is used most heavily by patrons in the College of Natural Sciences. The table with shaded cells shows affiliation by purpose of use and the dark cells show that Natural Sciences uses the Web of Knowledge for both sponsored and non-sponsored research. The empty white cells are also easily seen. This level of granular detail, which can be filtered even further, is pertinent to designing library instruction programs, making collection development decisions, and marketing resources.

**Implications**

The UMass Amherst Libraries will continue to run the survey for the foreseeable future. The successful implementations, high response rate, lack of negative feedback, and the utility of the data have resulted in the decision to collect survey data continuously. The libraries will also explore expanding the survey scope to include other resources. Moving from an annual sample to continuous data collection provides current and ongoing data that is available to be analyzed alongside other data such as circulation, interlibrary loan, building use, and network access; truly the culture of assessment as described by Lakos and Phipps.²⁰

The relationship between MINES and COUNTER data may also be further explored. Specifically, it would be useful to determine how much electronic resource use is not captured by MINES. It may also be informative to examine the relationship between MINES, COUNTER, and vendor data more closely. It is challenging for some libraries to integrate separate COUNTER reports into a holistic picture of e-resource use, and one advantage to MINES is that all use is collected in a single dataset. The MINES dataset can be combined with COUNTER data in the Tableau environment for a deeper and more granular view of COUNTER data. Some libraries without access to Tableau might request of their electronic resource management vendor the ability to import MINES data into their ERM to achieve a similar analysis. This deeper picture
of patron activity is achieved anonymously without the need to track the path of individual patrons through various library and university systems and the associated implications for confidentiality, privacy, or ethics.

Conclusion
This paper contrasts the implementation of the two sampling designs for the ARL MINES for Libraries protocol at the same library, the University of Massachusetts in Amherst, discussing the advantages and disadvantages of each. The findings demonstrate why running the every Nth MINES study continuously is a good idea for libraries, and we described a valid and reliable implementation scheme using EZproxy. We show how using Tableau Software to analyze MINES data permits adjustments to data collection in real time, for example, by changing the frequency of N to answer new research questions. We compared the sampled data on certain variables to the population of data collected at the EZproxy server in the SPU logs to show that the sample can be relied upon for valid inferences about the population. We illustrated how Tableau can present data relationships that can lead to decisions and actions by the library. We demonstrated how, with one vendor as an example, the joining of MINES data to COUNTER data can enhance the picture of how the resource is used and therefore, how the library might better serve patrons who consult that resource. Finally, we proposed that collecting MINES data continuously will lead to future service enhancements, especially if the data is imported into data visualization software, like Tableau, which makes the data easier to analyze, understand, and communicate. We anticipate that we will continue to collect valuable, actionable data to present a comprehensive picture of e-resource use to library and campus stakeholders, specifically informing collection development, instruction, support for research, marketing, and liaison work.

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Endnotes
1. COUNTER, “Counting Online Usage.”
2. COUNTER, “Code of Practice.”
4. ProQuest, “360 Counter.”
5. EBSCO, “EBSCO Usage Consolidation.”
8. Marcum and Schonfield, Driving with Data, 7.
10. Marcum and Schonfield, Driving with Data, 7.
13. ExLibris, “SFX.”
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Abstract
While libraries are using increasingly sophisticated metrics to determine electronic resources’ usefulness, impact, and cost effectiveness, much of this data reflects past usage. More nuanced information is still needed to guide collection developers’ decisions about which content to purchase, borrow, or deselect. To fill this gap, librarians at the Oregon State University Libraries and Press (OSULP) and a programmer at Ohio State University Libraries (formerly at OSULP) are currently testing the utility of a pop-up survey to gather patron feedback at their point of use. By building an open-source application that inserts a survey between a citation and the full-text, librarians are better positioned to capture users’ real-time reasons for selecting a given resource. Usage data can then be linked to qualitative information through questions such as whether a resource is being used for research or teaching; whether the user considers the journal core to their project; or what access to the resource will enable them to do. Inspired by MINES for Libraries this application was created to provide meaning beyond what usage statistics offer. Early results are promising; they show that respondents provide information that can help OSULP make discrete renewal decisions. Moreover, respondents’ sentiments about why they are using resources, such as to complete an assignment or for a grant, could be used to demonstrate OSU Libraries value and impact. This paper discusses the project, the survey tool, and initial findings from a survey of JSTOR and Elsevier e-journals.

Introduction
This conference paper describes a prototyping project where Oregon State University Libraries and Press (OSULP) developed and deployed a point of use, or intercept survey, to capture qualitative information from users at the point where they had chosen to view a journal or journal article. The project, the survey tool, and initial findings are described. Deployment of a point of use survey is a time-tested means for libraries to assess their patrons’ use of electronic collections. In fact, libraries have turned to Measuring the Impact of Networked Electronic Services (MINES for Libraries) since 2003 to learn about their users purposes for using resources and to better link that purpose to their patron demographics. OSULP’s infrastructure relies on proxy servers to deliver the survey, one of a few methods recommended as part of MINES. This project targeted specific e-journal titles from JSTOR and Elsevier to learn about OSULP patrons reasons for selecting a given title, their demographic information, whether the title was core or supplemental to their needs, and what access to the title enabled them to do. Initial findings give example to Reese’s description and testing of the software articulated in his 2013 Ariadne article and to Oakleaf’s recommendation in The Value of Academic Libraries encouraging librarians to try “products like MINES for Libraries with the potential to ask library users about how they will use” e-resources as one way of showing institutional impact. Surveying targeted journals to learn what access enables students and faculty to do contributes to the broader conversation about using intercept surveys for assessment of e-resources.

Literature Review
Key literature about intercept, or, interchangeably, point of use surveys, discuss their use, survey methodology, implementation, issues encountered, and recommendations going forward as part of academic libraries assessment of electronic resources. Franklin and Plum share methodological considerations and results from several implementations of MINES during 2003–2005. They found that grant funded researchers affiliated with US academic health centers primarily researched from off campus and faculty with the same affiliation were mostly seeking materials for their instruction, also when off campus. An interesting contrast was among undergraduates who went to their US academic main libraries to use e-resources, despite their availability from
anywhere, which may be a reflection of when the survey was conducted. Going forward, Franklin and Plum recommend that libraries establish a “network assessment infrastructure” where surveys like MINES can be combined with transaction data and where the network includes vended e-resources along with open-access content and local digital collections and repositories.

Kyrillidou, Plum, and Thompson build on previous knowledge about implementing intercept surveys, nonresponse bias and sampling plans all with respect to the MINES for Libraries survey framework. As libraries decide on their survey infrastructure and sampling plan and how they will handle non-respondents, they should create a good fit for their own community when conducting a survey in lieu of wholesale adoption of a protocol. Interested libraries may wish to calculate survey nonresponse bias by employing primarily optional protocols where a small percentage of mandatory surveys are required so nonresponse can be measured. Libraries can choose from a few options for sampling plans such as a random moment sample. MINES suggests randomly selecting two hours per month for a set number of months or over one year. Another option is to use an every-Nth sample, where a survey pops-up once every 200th, 500th, or 1,000th use.

As part of the Ontario Council for University Libraries (OCUL), York University participated in two rounds of the MINES survey, 2004–05 and 2009–10 to show the value of investing in e-resources, learn about their patrons purpose of use, and to inform purchasing decisions. Respondents were asked demographic questions and to indicate if they were on- or off- campus. For their purpose of use they were asked if their use was for funded or unfunded research, instruction, or coursework and they were asked to mark why they chose a given resource such as an important resource in their field, a recommendation, a reference from another source, etc. York sampled every 250th instance and the survey, which ran for twelve months, was optional. Besides finding that most faculty use was off campus (70%) and for coursework (72%), they found it helpful to learn which e-resources faculty value because it confirmed usage of consortial purchases. York hoped, in future instances, to test linking undergraduate use via the proxy server to student GPAs (while observing confidentiality) and to try to identify specific journal titles in a package as a way to learn which are important to a given discipline allowing the library to focus its purchases on those titles. Overall, York concluded that it was possible to quantify how e-resources contribute to the work faculty perform, and by extension, to the university’s success.

Prototype and Rationale
This project is in a prototyping phase as we continue to test and refine the code, the survey construction, and deployment methodology. Learning goals for this phase of the project were to see if the tool performed as expected; to explore what could be learned from respondents about why they wanted to use a given journal or set of journals; and, to learn if the results could contribute to the library’s story about its value and impact on campus. Would learning how faculty and students use library collections at their point of use aid the library in demonstrating how it contributes to our parent institution? Team members wanted to move beyond demonstrating the implied value of library collections through cost per use metrics to uncover the purpose of use. By uncovering the purposes for why collections are used, could a connection to student learning or faculty productivity be established? To explore this, respondents were asked questions such as: what will access to this library resource help you do and to select whether the resource is core or supplemental to their need. By capturing responses in the context of a survey tool and research project we sought to gather evidence to articulate these connections between library collections and students and faculty use for internal benefit as well as institutional stakeholders and partners.

Code Development and Iteration
The code for the survey framework came out of OSULP’s participation in the MINES for Libraries program. OSULP participated in the MINES survey to capture user input on how e-resources support their non-instructional research activities. In order to generate the MINES survey, the programmer (now at The Ohio State University Libraries) wrote code to insert the survey within the proxy process. At this point it became apparent that the code could be modified and repurposed to gather feedback about specific e-resources, such as journal title, rather than at a more general level.

We wanted to test the software, survey questions, and survey design across several iterations to
apply what was learned from earlier iterations to later ones. The spring after the programmer created the code, we conducted the first round with OSULP’s Elsevier unique title list (see Image 1: Survey Deployment Timeline). We chose this set of journals because it is a well-defined journal list that is highly valued, based on usage statistics, by our patrons. In fall 2013, after revisions to the code, the survey, and the survey design we tested the survey software again but focused on JSTOR journal titles acquired due to a gift from OSU’s Ecampus department. Ecampus asked OSULP to provide their constituent’s use of the JSTOR titles. Finally, in January 2014 the survey was tested on the JSTOR titles and the Elsevier titles. Elsevier titles were expanded to include all titles to which OSULP has access. OSULP participates in a consortial purchase with two other Oregon universities, which gives OSU patrons access to a suite of unique titles along with subscribed ones.

**Image 1: Survey Deployment Timeline**

![Survey Deployment Timeline Diagram]

**What the User Experiences**
For each testing period, the survey was programmed to display when users navigated to the OSULP e-journal list, a database, or discovery tool. After the user selected a targeted journal’s citation, an IRB form displayed, if the user consented to take the survey, they were presented with survey questions. After completing the questions, the user is directed to their intended article. Users who chose to not complete the survey were immediately passed to their intended article.

**Under the Hood**
Key to the success of triggering the survey to pop-up at the journal level is OSULP’s proxy server, EZProxy. For this survey infrastructure, the programmer developed and deployed a public proxy server on Apache. In this workflow the Apache proxy is added to play the key job of being a decision engine. Driven by SQL rules that monitor users’ IP addresses, the public proxy analyzes an article request; determines if the person should be displayed a survey; displays the survey when appropriate and when not, sends them to their requested article. On the whole, this workflow performed well for the JSTOR titles but not as seamlessly for the Elsevier titles, possible changes to remedy this are discussed in lessons learned. Reese explains additional technical details in his article “Improving Evaluation of Resources through Injected Feedback Surveys.”

**Survey Parameters/Methodology**
This paper reports some of the results from round three, which surveyed all of OSULP’s Elsevier titles and those acquired from JSTOR with the Ecampus
This survey, deployed in winter 2014, included six questions about use and three demographic questions. We captured 1,364 total responses. Sixteen percent of the respondents were faculty, instructors, or researchers; twenty-seven percent were graduate students, and fifty-three percent were undergraduates.

SQL rules were used to set question parameters. For example, respondents were required to respond to each question. No question had a default response. Two multiple-choice questions (which addressed a user's purpose and to what extent the journal is core or supplemental to the user) allowed respondents to choose multiple responses. For all other questions, respondents could choose only one response option. Although the survey was on all the time, rules controlled how often it was triggered. Rules were set to deliver the survey once every sixty minutes to IP addresses from OSULP’s Information Commons and to deliver the survey once every twenty-four hours for on- and off-campus IP addresses, the secured VPN, and the university’s floating Wi-Fi.

Survey questions were also constructed with SQL queries. Currently the software works well with multiple-choice and open comment questions. Additional questions types could be created, assuming available time and programming expertise.

Core Results
Respondents were asked to indicate if the resource they intended to use was core or supplemental to their course assignment, research, or teaching. They could also select, “I have not used this resource before,” “Other,” or, to leave an open-ended comment. Undergraduate students led in all categories followed by graduate students and faculty, which mirrors who responded the most to the survey (see Table 1: Core vs. Supplemental Use). Additional analysis is needed to learn if the rate of students saying they feel the source is core is higher or lower than faculty or graduate students.

Undergraduates also led in saying they had not used the resource before. This makes sense from a couple of perspectives. Given their relative lack of experience with research literature overall, compared to faculty and graduate students, they were likely retrieving an unknown item. This also can be explained because respondents were presented with the survey prior to encountering the article; so for many it was an unknown item. Faculty and graduate students may have been less likely to select this because they were retrieving known items.

Graduate students and faculty were more likely to say a resource was supplemental to their purpose than to indicate it was core. And, they chose this category more than undergraduates chose it—undergraduates more frequently chose core. We hypothesize that graduate students and faculty are engaged in more browsing for resources than undergraduates regardless of their purpose. Undergraduates’ response was the opposite; their resource was more likely core to their purpose than supplemental. The survey did not control for e-resources used for course reserves, which could explain this.
Table 1: Core vs. Supplemental Use

<table>
<thead>
<tr>
<th></th>
<th>Faculty Instructor Researcher</th>
<th>Grad student</th>
<th>Undergraduate Other student Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core</td>
<td>15%</td>
<td>26%</td>
<td>57%</td>
</tr>
<tr>
<td>Supplemental</td>
<td>24%</td>
<td>35%</td>
<td>42%</td>
</tr>
<tr>
<td>Haven’t used resource before*</td>
<td>3% (n=8)</td>
<td>34%</td>
<td>62% (n=29)</td>
</tr>
</tbody>
</table>

“What Will Access to this Library Resource Help You to Do?”

Undergraduates

This question has consistently resulted in rich responses from both undergraduates and faculty because it is open-ended and asks respondents to link their usage of a specific article or journal title to their immediate goals and purpose. Reading through a random selection of undergraduate comments suggests that OSULP could draw on the comments to contribute to OSULP’s story about the impact and value that individual resources have on undergraduate student work:

- Give my course assignment a resource
- I am currently gathering research articles on Schizophrenia from a neurological perspective for a research paper
- Finish my homework
- Complete a discussion board assignment for an e-campus class
- I need this information to complete a term project. The information contained in this article is very specific and I need this type of specific information.

For this paper, the author looked at one e-journal frequently accessed by students from a couple of angles to develop a picture about its value: student comments, usage statistics, and the JCR impact factor. Impact factor was chosen because it is a metric OSULP has used when reviewing e-resources for renewal, and it gives one perspective of how the given discipline values the journal. In future iterations, other metrics such as the Eigenfactor could be applied.

The targeted journal, Conservation Biology, although not part of the Ecampus purchase, was accessed seventeen times on the JSTOR platform. OSULP subscribes to the front file from Wiley-Blackwell, has some access through Ebsco’s Academic Search Premier, and access to the back file on JSTOR. Three students commented on the journal’s importance to their studies and on what access enabled them to accomplish albeit with some unspecified extra meaning embedded in the last comment:

- Complete a course
- Complete my assignments in a timely manner.
- Complete an assignment issued by my professor for a class I paid this institution for?

These commenters demonstrate their need for Conservation Biology and help the researchers understand why it was accessed 6,175 times in 2013. OSULP paid $1,118.05 resulting in a cost per use of just 18 cents. At that time, ISI Journal Citation Reports (JCR) calculated its impact factor to be 4.32. All angles point to the value that Conservation Biology holds for the OSU community and that OSULP should renew it, which we did. However, if the assignment calling for students to use this journal changes to not use it, these numbers will shift and a clear renewal decision may become complicated.

Faculty

Faculty and researchers responses to “What will access to this library resource help you to do?” were equally rich and also demonstrate how resources support the university’s twin missions of teaching and research. Respondents were quite forthright in their comments, which was a bit unanticipated:

- Create a syllabus for core course for a recently-approved PhD program in WGSS
- Speed up my writing
- Tenure and promotion
• Get funded proposals so the library can take its cut out of the overhead and then be able to get more books and better online access and grow

Here, the journal *Ecological Economics* from Elsevier was considered from multiple angles. This journal was chosen because respondents commented on it, and, for the purposes of this exercise the other data points, cost per use and impact factor, were able to be determined. A researcher gave the first comment and a faculty/instructor made the second one:

• Improve the health of the Willamette River ecosystem, do my job as an ag [agricultural] extension specialist, etc.
• Access is absolutely essential to my research, especially since I am a faculty member who is not on campus

In 2013, OSULP paid $2,303.88 for *Ecological Economics* and it had 5,661 uses resulting in a cost per use of just 40 cents. Its 2013 impact factor was 2.517. Combining these data points with the knowledge that researchers were using the journal to improve public health, demonstrates the value university research brings to the broader Oregon State University community, which as a land-grant university includes the state of Oregon.

In a lean fiscal year, OSULP could apply qualitative data such as these comments to renewal decisions when distinguishing between e-resources. As York found, such comments “elicit a more nuanced view” about the role a given journal plays in OSU’s research and teaching.21

**Lessons Learned**

With any experimental project, lessons are learned along the way. This project is no different. Lessons learned primarily centered around reducing respondent redundancy and survey design.

Kyrillidou recommends setting up a session ID which copies respondents previously entered values into subsequent iterations of a survey.22 Thus a respondent need only complete one survey per session. By applying this method OSULP would reduce respondent redundancy, an issue encountered with the Elsevier journals.

Future iterations will explore changes to our survey design. For example, nine questions is still a bit long. One possible solution is to alternate questions, for example in one round ask a question about core-ness and in another ask about purpose of use. Another strategy is to test if capturing existing data from the proxy server would suffice for the demographic questions.

Another aspect of survey design to reconsider is the sampling method. In lieu of sampling once every sixty minutes from OSULP’s Information Commons and once every twenty-four hours everywhere else, we could move to a randomly selected two hours per month over one year like the well-established MINES protocol.23 There are several variations of this, such as shortening the duration to several months. An alternate approach is to use an every-Nth sample, where a survey pops-up once every 200, 500, or 1,000 use depending on the size of the targeted population.24 A final option to look at is limiting the number of responses to a given journal where once five responses are captured the survey is turned off.

**Administration**

Library administration feels the results may play one part in demonstrating the value of Ecampus’ investment in the JSTOR purchases and to showing the library’s impact on student learning and faculty research. Additional analysis and implementations of the survey is needed to follow Ecampus use over time. During this cycle, ten of the titles purchased with Ecampus funds were used, however Ecampus patrons did not use them. They did use other JSTOR and Elsevier titles, which raises more questions about the link between investment and use. For example, after additional analysis and surveys, OSULP learns that Ecampus users primarily use Elsevier titles, would it be more fitting for OSULP to ask or direct Ecampus support to the Elsevier subscription? Would Ecampus only want support to be applied to titles their students and faculty have used in the past, thus limiting the possibility for contributing to unknown items used in the future?

**Next Steps**

The programmer has released the initial code on GitHub at [https://github.com/reeset/ics](https://github.com/reeset/ics). It is available for use and partners interested in developing the code or sharing data are welcome and should contact the programmer or this paper’s author. One key area ripe for development is integration into Qualtrics’Qualtrics API. It is hoped this will help with some of the survey
misbehavior. Even though the project team made several adjustments to how frequently a user encountered a survey for the Elsevier titles, the survey still over-presented itself. Resolving this is a high priority. Qualtrics integration would also mean that Qualtrics would carry the load of survey construction rather than using SQL queries. Taking advantage of features such as skip logic would allow more freedom around the types of surveys and questions that are used. And, using Qualtrics reports would lighten the burden of analysis for investigators. Investigators could use Qualtrics reports instead of or in addition to spreadsheet software to analyze data.

Conclusion
Initial findings show new possibilities for capturing how patrons use targeted e-journals, why they value a given resource, and learning whether they feel a resource is core or supplemental to their needs. This project models one way libraries can demonstrate the value and impact of another department’s contribution to library resources. Capturing data at patrons’ point of need enables libraries to articulate their value and impact on student and faculty productivity and ultimately to an institution’s mission and goals.

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Evaluation of the Applicability of E-S-QUAL for Assessing the Service Quality of Social Media: A Case Study of an Academic Library’s Facebook Service

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Abstract
The purpose of this study is to explore the applicability of the E-S-QUAL instrument in the context of libraries’ social media services. As libraries have increased their use of social media such as Facebook and Twitter to interact with users and share information, the evaluation of the services has been emphasized to improve service strategies and meet user needs. However, there are no criteria or tools to measure the service quality of libraries’ social media. To address this gap, this study adopted E-S-QUAL and examined its applicability in this study setting. A case study was conducted using a structured questionnaire, utilizing the modified E-S-QUAL instrument, on an academic library’s Facebook service. The results showed that the four factor structure of the modified E-S-QUAL was confirmed. Items and factors had high internal consistency and convergent and discriminant validity. This study contributes to provide a tool to measure the service quality of libraries’ social media services.

INTRODUCTION
Academic libraries have adopted social media in delivering library services in order to meet their changing needs. Social media enable libraries to recommend, interpret, evaluate, and use information flexibly with more resources to interact with users. Among 204 libraries of research universities, according to the Carnegie Classification system, 173 (85%) promoted their Facebook pages on their libraries’ main websites and 155 (75%) put their Twitter account links on the main page. Among these services, the average number of Facebook and Twitter users is over 1,000. Libraries’ social media services indicate a new format of information delivery using social media, and users obtain information from libraries through social media.

Previous studies have quantified the use of these services, surveyed librarians’ perceptions of social media as part of library services, and identified patrons’ usage quantitatively. However, those numbers are limited in revealing other qualitative factors such as impact, efficiency, satisfaction, and quality. Libraries’ emerging services on social media have heightened the need for understanding the service quality from user perspectives in order to improve service strategies. While several authors have recognized the importance of evaluating libraries’ social media services, none has published research that applies service quality assessment to the services, and no instruments have been developed for measuring user-perceived service quality of libraries’ social media.

To address this gap, this study adopted the E-S-QUAL instrument which was developed by Parasuraman, Zeithaml, and Malhotra in 2005 to measure customers’ perceived service quality related to electronic retail websites. By utilizing this instrument, the researcher modified the statements to fit into the academic libraries’ social media service contexts. This study aims to assess the applicability of the modified E-S-QUAL instrument in the measurement of libraries’ social media service quality. The following research questions were addressed:

1. To what extent does the modified E-S-QUAL instrument measure the user-perceived service quality of libraries' social media in terms of reliability and validity?
2. To what extent is the modified E-S-QUAL able to measure the importance and performance of each item in order to identify its relative importance for evaluating service quality by users?
3. To what extent is the modified E-S-QUAL affected by different user characteristics?
This study will contribute to the introduction of E-S-QUAL in its use in library service contexts. The results may help library managers identify tools to assess user-perceived service quality, which goes beyond usage statistics. The results of this applicability study will be of value to evaluation researchers for the development of tools for assessing libraries’ e-service quality.

LITERATURE REVIEW
Evaluation of Libraries’ Social Media Services
With an increase in the popularity of libraries’ social media services, several studies analyzed usages and judged the services’ status based on quantitative measures. Xia analyzed Facebook groups of two academic libraries to evaluate the effectiveness of Facebook in promoting library visibility using quantitative criteria such as the number of members, wall posts, discussions, and the earliest and latest posts to measure the groups’ activity. Wan examined how successful Facebook has been to reach out to their library patrons using the number of “fans.” Garcia-Milian et al. investigated seventy-two academic health science libraries’ Facebook pages, and found positive relationships between the content on Facebook pages and their popularity, the number of fans; in particular, the more video content on library Facebook pages, the more fans they have. Del Bosque et al. used quantifiable measures such as the number of followers, interactions with them, and updated tweets to reflect how library Twitter services were used by end-users by indicating the objective status of each account. Landis emphasized that libraries need to establish measurable goals for using social media, which enables libraries to evaluate their success and provide services meeting their patrons’ needs. However, those measures are limited in revealing qualitative factors. Powers et al., Cuddy et al., and Le Gac indicated that qualitative data from user surveys provide feedback and types of friends or followers. However, none of these studies actually evaluated their services qualitatively.

A study considering social media as reference service tools in libraries showed that users were aware of those service platforms; however, the number of transactions for questions and answers was low in their study. Therefore, it might not be suitable to use guidelines and evaluation measures developed for reference services to evaluate libraries’ social media services. The services have different purposes such as communication, announcements, and marketing rather than Q&A. Also, as the uses of social media are still evolving, users’ perceptions for the services need to be analyzed to understand their needs through social media and to improve the services.

Perceptions of Libraries’ Social Media Uses
Survey studies have been conducted to investigate how librarians and patrons perceive the services. Librarians considered social media as part of a library’s strategic plan and as important for communication. They agreed on new roles for social media such as communicating with users, posting messages for providing library events and resources, monitoring feeds, and networking with the staff of other organizations. In particular, academic librarians perceived that Twitter was a useful tool for extending library services and collaborative work, developing professional capacity by receiving and communicating with other professionals and organizations, and presenting an up-to-date image to patrons. Some librarians agreed that social media could be used in a positive way. However, there were negative views of social media. Librarians interviewed by Hendrix et al. indicated that the platform’s usefulness and effectiveness could not be determined. They considered that Facebook did not serve an academic purpose and was outside the realm of professional librarianship.

User survey studies revealed that users declined to accept a “friend” relationship with libraries because of personal privacy infringement. Privacy was an issue affecting participation because students might not be willing to share personal information with libraries. Park identified six factors affecting different usage patterns by user groups at a university: “desire for expression, peer influences, familiarity with IT, sensitivity to privacy, nature of using the Internet, and perception of social media.” Based on these features, he suggested that they need to have strategies for different user groups and emphasized the balance between information exposure and privacy. However, few studies investigated perceptions of users on libraries’ social media services using scales with criteria. It is important to explore an e-service quality instrument to assess the quality of the services from user perspectives.
An Instrument Measuring E-Service Quality: E-S-QUAL
As e-services have emerged, many studies have been conducted developing instruments for evaluating e-service quality to include characteristics of online services and users rather than using instruments for offline services. Liu defined e-service as “an interactive, content-centered, and Internet-based customer service that is driven by the customers and integrated with the support of technologies and systems offered by service providers who aim at strengthening the customer-provider relationship.” Parasuraman et al. defined e-service quality broadly as “encompassing all phases of a customer’s interactions with a web site.”

Among several scales for measuring e-service quality, the E-S-QUAL instrument was selected in this study because it has representative features about e-service quality, and has been applied in different e-service industries and showed good psychometric properties in terms of reliability and validity. E-S-QUAL consists of four dimensions with twenty-two items, developed in an e-retail service setting by Parasuraman et al. However, E-S-QUAL has been applied in nonprofit fields such as university websites and e-governments. For these reasons, this proposed study selected E-S-QUAL to evaluate its applicability to measure the service quality of libraries’ social media.

The four dimensions of E-S-QUAL are efficiency, system availability, fulfillment, and privacy. Parasuraman et al. defined efficiency as “the ease and speed of accessing and using the site;” system availability as “the correct technical functioning of the site;” fulfillment as “the extent to which the site’s promises about order delivery and item availability are fulfilled;” privacy as “the degree to which the site is safe and protects customer information.” In this proposed study, the three dimensions’ definitions are applicable, but fulfillment was modified to “the extent to which the service’s promises about dependable and accurate information delivery are fulfilled” in order to include features of libraries' social media services.

To test the instrument’s validity, Parasuraman et al. used three endogenous variables: overall service quality, perceived value, and loyalty intentions, because these are strongly related to users’ evaluation of service quality. Perceived value includes items measuring “users’ overall price, convenience, and control;” loyalty intentions include items measuring “behavioral loyalty.”

RESEARCH DESIGN
A case study validated the modified E-S-QUAL measures at an academic library which has provided the Facebook service. Among research university libraries according to the Carnegie Classification 2010 Basic, a library which had a high volume of users for its Facebook service and accepted the invitation to participate in this study was selected. The participating library has operated its Facebook service since June 2009, and has 1,231 users who connected with the library Facebook account as of June 23, 2014.

The survey was conducted using a structured questionnaire which was adapted by using E-S-QUAL and three variables: efficiency (eight items), system availability (four items), fulfillment (seven items), privacy (three items), overall quality (one item), perceived value (four items), and loyalty intentions (five items). The E-S-QUAL 22 items were measured using a five-point scale, and three variables were measured using a ten-point scale. The statements of the E-S-QUAL items and three variables were modified to fit into the library’s social media services.

The target population of this survey was people who had connected with the participating library’s Facebook page and had used the service. "Service use" indicates user behavior such as being aware of library postings, reading those postings, clicking links, and getting information. To recruit survey participants, the library manager posted the survey advertisements on the library’s Facebook pages for three weeks from June 25, 2014 to July 18, 2014, and the ads were posted in student groups’ Facebook pages operated by the university to increase the response rate for the last one week. Respondents who completed the questionnaire were asked to submit their e-mail address for a chance to win a $50 Amazon.com gift card. The 88 completed responses were collected, and the data were analyzed with primarily quantitative methods to answer the research questions.

Statistical analyses confirmed reliability and validity. Exploratory and confirmatory factor analyses were used to identify dimensions of
the E-S-QUAL’s 22 items in this study setting. Correlation and regression analyses were used to test the scale’s convergent, discriminant, and predictive validity. Comparisons among different user characteristics were analyzed to see whether those variables were related to service quality evaluation.

**DATA ANALYSIS and RESULTS**

**Sample Profile**
The characteristics of the sample demographic are presented in Table 1. The majority of respondents are female, age 18–29, and undergraduate students. In general, Facebook user characteristics are women, ages 18–29, and college educated, and academic libraries’ main users are undergraduate students. These facts support that the methodology for recruiting participants can be used in other studies.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Item</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>28</td>
<td>31.8</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>60</td>
<td>68.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>88</td>
<td>100.0</td>
</tr>
<tr>
<td>Age</td>
<td>18–29</td>
<td>73</td>
<td>85.9</td>
</tr>
<tr>
<td></td>
<td>30–49</td>
<td>8</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td>50–64</td>
<td>4</td>
<td>4.7</td>
</tr>
<tr>
<td>Affiliation</td>
<td>Undergraduate</td>
<td>68</td>
<td>75.6</td>
</tr>
<tr>
<td></td>
<td>Master’s</td>
<td>1(1)*</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Doctoral</td>
<td>6(3)</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>Faculty</td>
<td>2</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>Library Staff</td>
<td>5(1)</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>Staff</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>3(2)</td>
<td>3.3</td>
</tr>
</tbody>
</table>

(*non-member of the university

**Table 1. Respondents’ Demographic Information**

Reliability and Validity Assessment of the Modified E-S-QUAL
In order to test reliability and validity, factor, correlation, and regression analyses were conducted. The relationships between measured variables and latent constructs of E-S-QUAL have not been verified in a library’s social media context; hence, an exploratory factor analysis was conducted to identify the underlying structure of measured variables and to detect low-fit variables, then a confirmatory factor analysis was conducted to test that measures of four constructs in this study setting were consistent with the original E-S-QUAL’s structure.

Table 2 presents the results of exploratory and confirmatory factor analyses for the modified E-S-QUAL, as well as Cronbach alpha values for the four dimensions and item loading for each item. The Cronbach alpha values range from 0.848 to 0.937, exceeding the conventional minimum of 0.7 and within the range of previous studies’ results, which demonstrates high internal consistency of each dimension. The KMO and Bartlett’s statistics show that the KMO is greater than 0.7 at 0.851 and the Bartlett is significant ($\chi^2$ (df=231) = 989, p < 0.001), indicating that this data set is suitable for factor analysis. Communality values of twenty-two items are from a low of 0.595 (EFF6) to a high of 0.902 (SYS4). No item was excluded for analysis.

Exploratory factor analysis was conducted using principle component analysis and the Varimax rotation method. The result shows that four factors which have an Eigen Value > 1 were extracted.

According to factor loading values suggested as the minimum ±3.5, items of efficiency, system availability, and privacy dimensions have over 0.4 loadings. The items in these three dimensions are
strongly related. High loading values with strong reliability support items’ relations within each dimension. However, the fulfillment dimension has one item (FUL3) below 0.35, which is, “It quickly provides information that I seek.” It is grouped with efficiency items according to the exploratory factor analysis. Also, the loading value of EFF5 is higher in system availability dimension (0.636) rather than efficiency dimension (0.432), which occurred in other studies such as Petnji et al.,\(^{39}\) Marimon et al.,\(^{40}\) and Fuentes-Blasco et al.\(^{41}\)

Confirmatory factor analysis showed significant item-construct loadings in this study setting (Table 2). The loading values in the four dimensions are in the range of 0.580–0.949. The four latent constructs are well reflected by their corresponding measured variables. The overall goodness-of-fit statistics imply that the data fit the proposed model reasonably well. According to the guidelines for model fit,\(^{42}\) the values of CFI, NFI, and TLI above 0.90, and RMSEA in the range of 0.05 to 0.10 indicate a fair fit. The indexes of this proposed study’s twenty-two item model are well above those conventional cutoff values. These findings support the soundness of the modified E-S-QUAL scale’s factor structures in the library’s Facebook service context.
Table 2. Exploratory and Confirmatory Factor Analysis of the modified E-S-QUAL Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>CFA Loadings</th>
<th>EFA loadings&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Eigen values</th>
<th>% of Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>C.R&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Efficiency (Cronbach alpha=.937)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EFF1</td>
<td>3.39</td>
<td>1.146</td>
<td>.883</td>
<td>7.799</td>
<td>.837</td>
<td>-</td>
</tr>
<tr>
<td>EFF2</td>
<td>3.41</td>
<td>1.263</td>
<td>.910</td>
<td>8.133</td>
<td>.830</td>
<td>-</td>
</tr>
<tr>
<td>EFF3</td>
<td>3.36</td>
<td>1.163</td>
<td>.913</td>
<td>8.128</td>
<td>.852</td>
<td>-</td>
</tr>
<tr>
<td>EFF4</td>
<td>3.36</td>
<td>1.166</td>
<td>.842</td>
<td>7.336</td>
<td>.838</td>
<td>-</td>
</tr>
<tr>
<td>EFF5</td>
<td>3.84</td>
<td>1.180</td>
<td>.674</td>
<td>5.575</td>
<td>.432</td>
<td>.636</td>
</tr>
<tr>
<td>EFF6</td>
<td>3.77</td>
<td>1.159</td>
<td>.701</td>
<td>5.847</td>
<td>.565</td>
<td>-</td>
</tr>
<tr>
<td>EFF7</td>
<td>3.34</td>
<td>1.256</td>
<td>.790</td>
<td>6.755</td>
<td>.768</td>
<td>-</td>
</tr>
<tr>
<td>EFF8</td>
<td>3.41</td>
<td>1.245</td>
<td>.772</td>
<td>-</td>
<td>.761</td>
<td>-</td>
</tr>
<tr>
<td>System Availability (Cronbach alpha=.920)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYS2</td>
<td>4.16</td>
<td>1.200</td>
<td>.949</td>
<td>12.418</td>
<td>.887</td>
<td>-</td>
</tr>
<tr>
<td>SYS3</td>
<td>4.18</td>
<td>1.167</td>
<td>.759</td>
<td>7.697</td>
<td>.687</td>
<td>-</td>
</tr>
<tr>
<td>SYS4</td>
<td>4.16</td>
<td>1.180</td>
<td>.918</td>
<td>-</td>
<td>.876</td>
<td>-</td>
</tr>
<tr>
<td>Fulfillment (Cronbach alpha=.913)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUL1</td>
<td>3.86</td>
<td>1.025</td>
<td>.713</td>
<td>6.890</td>
<td>-</td>
<td>.650</td>
</tr>
<tr>
<td>FUL2</td>
<td>3.52</td>
<td>1.191</td>
<td>.721</td>
<td>6.721</td>
<td>.577</td>
<td>-</td>
</tr>
<tr>
<td>FUL3</td>
<td>3.41</td>
<td>1.226</td>
<td>.587</td>
<td>5.030</td>
<td>.763</td>
<td>-</td>
</tr>
<tr>
<td>FUL4</td>
<td>3.41</td>
<td>1.300</td>
<td>.580</td>
<td>4.988</td>
<td>.740</td>
<td>-</td>
</tr>
<tr>
<td>FUL5</td>
<td>4.14</td>
<td>1.047</td>
<td>.901</td>
<td>10.697</td>
<td>-</td>
<td>.828</td>
</tr>
<tr>
<td>FUL6</td>
<td>4.32</td>
<td>1.095</td>
<td>.889</td>
<td>10.370</td>
<td>-</td>
<td>.855</td>
</tr>
<tr>
<td>FUL7</td>
<td>4.43</td>
<td>.974</td>
<td>.904</td>
<td>-</td>
<td>-</td>
<td>.854</td>
</tr>
<tr>
<td>Privacy (Cronbach alpha=.848)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRI1</td>
<td>4.16</td>
<td>1.238</td>
<td>.773</td>
<td>5.748</td>
<td>-</td>
<td>.568</td>
</tr>
<tr>
<td>PRI2</td>
<td>4.30</td>
<td>1.173</td>
<td>.831</td>
<td>6.250</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PRI3</td>
<td>4.07</td>
<td>1.265</td>
<td>.793</td>
<td>-</td>
<td>-</td>
<td>.713</td>
</tr>
</tbody>
</table>

Goodness-of-fit statistics

* X2 = 544.35 (p < .001); df=203; CFI=.933; NFI=.945; TLI=.967; RMSEA=.013

**NOTE:** CFI = Comparative Fit Index; NFI = Normed Fit Index; RFI = Relative Fit Index; TLI = Tucker-Lewis Index; RMSEA= Root mean square error of approximation.

b. C.R. = Critical Ratio (> 1.965); Significant at p < .01.
c. Extraction Method: Principal Component Analysis; Rotation method: Varimax rotation using SPSS22; Loadings < .35 not shown

In order to test convergent and discriminant validity, this study adopted the Fornell and Larcker<sup>43</sup> method. They suggested that if the AVE \<sup>AVE</sup> of each dimension is over 0.5, the construct’s convergent validity is adequate. Table 3 presents that the AVE value of each dimension is in the range of 0.564–0.707, which supports convergent validity in this study setting. For discriminant validity, if the AVE of each construct is larger than the squared correlation between the two constructs (R-squared), the discrimination of constructs is fully satisfied.<sup>44</sup> This proposed study’s AVE values of the four
dimensions are larger than R-squared. The discriminant validity is supported.

Table 3. Inter-correlations a

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>EFF</th>
<th>SYS</th>
<th>FUL</th>
<th>PRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency (EFF)</td>
<td>.707*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>System Availability (SYS)</td>
<td>.54</td>
<td>.564</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fulfillment (FUL)</td>
<td>.57</td>
<td>.60</td>
<td>.648</td>
<td>-</td>
</tr>
<tr>
<td>Privacy (PRI)</td>
<td>.58</td>
<td>.62</td>
<td>.75</td>
<td>.657</td>
</tr>
</tbody>
</table>

a. All values are significant p < 0.05.
b. Values along the diagonal indicate the AVEs.

This study identified relationships between user-perceived service quality measured by the modified E-S-QUAL and constructs highly related to service quality, in order to determine further validation of the tool. These relationships have been analyzed by other studies, offering evaluations of the scale's criterion-related validity.45

Predictive validity refers to the relationships between the dimensions and criterion variables, which are overall quality, perceived value, and loyalty intentions. These three values were used in the original E-S-QUAL and have statistically significant correlations. However, in this data set, only efficiency is significantly positively related to perceived value and loyalty intentions (Table 4).

When using the factor values calculated by factor analysis in order to minimize correlations among items, only factor 1 is significantly positively related to the three criterion variables. Factor 1 is a group of efficiency items. Correlation analysis shows low values between system availability and perceived value (0.296), privacy and loyalty intentions (0.273).
Table 4. Regression Analyses of Variables on the Four Dimensions’ Summed or Factor Scores

<table>
<thead>
<tr>
<th>Independent variables – Summed scores</th>
<th>Dependent</th>
<th>Overall Service Quality</th>
<th>Perceived Value</th>
<th>Loyalty Intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Std. beta</td>
<td>Sig.</td>
<td>Std. beta</td>
<td>Sig.</td>
</tr>
<tr>
<td>E-S-QUAL All items</td>
<td>.352</td>
<td>0.019</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.442</td>
<td>.000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Efficiency</td>
<td>.204</td>
<td>.304</td>
<td>.448</td>
<td>.056</td>
</tr>
<tr>
<td>System Availability</td>
<td>.024</td>
<td>.917</td>
<td>.205</td>
<td>.404</td>
</tr>
<tr>
<td>Fulfillment</td>
<td>-.005</td>
<td>.987</td>
<td>-.195</td>
<td>.316</td>
</tr>
<tr>
<td>Privacy</td>
<td>.081</td>
<td>.663</td>
<td>-.114</td>
<td>.591</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.304</td>
<td>.002</td>
<td>.248</td>
<td>.011</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent variables – Factor scores*</th>
<th>Dependent</th>
<th>Overall Service Quality</th>
<th>Perceived Value</th>
<th>Loyalty Intentions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
<td>.547</td>
<td>.000</td>
<td>.594</td>
<td>.000</td>
</tr>
<tr>
<td>Factor 2</td>
<td>.191</td>
<td>.135</td>
<td>.090</td>
<td>.487</td>
</tr>
<tr>
<td>Factor 3</td>
<td>.191</td>
<td>.135</td>
<td>.165</td>
<td>.207</td>
</tr>
<tr>
<td>Factor 4</td>
<td>.135</td>
<td>.287</td>
<td>.017</td>
<td>.897</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.327</td>
<td>.000</td>
<td>.330</td>
<td>.001</td>
</tr>
</tbody>
</table>

* Factor scores were generated by SPSS 22 when the factor analysis was conducted.

Gaps between Importance and Performance
This study measured both the importance and performance of each item. Service quality is typically measured by the gap between user-perceived importance for services in general and those perceptions of performance of the services offered by a particular library.46 A gap analysis was conducted in order to evaluate to what extent items are perceived as important statements for the service quality of libraries’ social media by users as well as to what extent items are perceived as delivered in the participating library Facebook service.

Table 5 presents the results of the means of each item's importance and performance, differences between them, and presents a paired t-test result to identify whether the differences are significant. The values for importance are in the range of 3.78 (EFF4)–4.72 (FUL7), and the mean of total items is 4.30. Users mostly perceived the modified items as important; the most important dimension was privacy, followed by fulfillment, system availability, and efficiency. The gap scores are all negative; the fulfillment dimension has the largest gap. Ali conducted a gap analysis using E-S-QUAL in an Internet banking service; efficiency was identified as the most important dimension and privacy had the largest gap score (negative). User perceptions on dimensions are not the same for the different services.

According to the paired t-test, the gaps between importance and performance in EFF4, EFF5, SYS1, SYS2, SYS4 items are not significantly different in this study setting. Other items’ pairs are significantly different (p < 0.05). Gap analysis helps library social media managers prioritize those most likely to provide service improvement.48

Table 5. Paired T-Test between Importance and Performance Values

<table>
<thead>
<tr>
<th>Item</th>
<th>Modified Statements</th>
<th>Impo Mean</th>
<th>Perf Mean</th>
<th>Perf - Impo</th>
<th>t</th>
<th>df</th>
<th>sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFF1</td>
<td>This service makes it easy to find library information that I need.</td>
<td>4.21</td>
<td>3.28</td>
<td>-0.93</td>
<td>5.605</td>
<td>60</td>
<td>.000</td>
</tr>
<tr>
<td>EFF2</td>
<td>This service makes it easy to get library information.</td>
<td>4.13</td>
<td>3.40</td>
<td>-0.73</td>
<td>4.056</td>
<td>59</td>
<td>.000</td>
</tr>
<tr>
<td>EFF3</td>
<td>It enables me to get to library information quickly.</td>
<td>4.03</td>
<td>3.32</td>
<td>-0.71</td>
<td>4.653</td>
<td>58</td>
<td>.000</td>
</tr>
</tbody>
</table>
In addition to the paired t-test, a quadrant analysis was conducted to identify how users understand each item for the service relatively using the gap scores in a visualized format as well as to test providing the survey results for strategic planning beyond simple frequency distribution. Quadrant analysis is a graphic correlation technique using two dimensions: one dimension indicates the user-perceived importance of each item, and the other dimension indicates the user-perceived performance for the service. On the quadrant chart, each item’s x-value is the mean of importance and the y-value is the mean of importance minus the mean of performance in order to present the gap values. Both mean values of importance and gap scores are used for coordinates, which make four quadrants.

Figure 1 presents the quadrant chart using this study data. Table 6 identifies items in each quadrant. Items falling into quadrant one indicate that users perceive those items as very important and they rate the library service as trying to meet those expectations. Libraries retain these items, and resources could be saved and reallocated. Items in quadrant two are important but do not meet the users’ expectations. Libraries may need to change the service in order to improve performance or to be exposed to users. Items in quadrant three reflect that users perceived those items as relatively unimportant, but they identified those expectations in the service. Libraries refocus the service to enhance the importance of these items or to put their efforts on more important features. Items in quadrant four may not be seen by users or are not important and the service does not have
those items’ attributes. Libraries may need to promote those attributes to improve importance or ignore them.

Table 6. Results of Quadrant Analysis

<table>
<thead>
<tr>
<th>Quadrant</th>
<th>Recommendation</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quadrant 1</td>
<td>Retain</td>
<td>FUL5, FUL6, FUL7, PRI1, PRI2, SYS2, SYS3, SYS4</td>
</tr>
<tr>
<td>Quadrant 2</td>
<td>Improve</td>
<td>FUL3, FUL4, PRI3</td>
</tr>
<tr>
<td>Quadrant 3</td>
<td>Reposition</td>
<td>EFF4, EFF5, EFF6, EFF8, FUL1, SYS1</td>
</tr>
<tr>
<td>Quadrant 4</td>
<td>Ignore</td>
<td>EFF1, EFF2, EFF3, EFF7, FUL2</td>
</tr>
</tbody>
</table>

Figure 1. Quadrant Chart of the Modified E-S-QUAL 22 Items

Note: Dash lines indicate averages of the total items’ importance and performance scores

Differentiation of User Characteristics
Different user characteristics were measured to assess whether user-perceived service quality is associated with user groups, access frequency, different social media, and demographic information (age, gender, and position). In this study data set, there were no significant differences among them. This result could be due to the small data set. Further data collection and analyses will be necessary in a future study.
DISCUSSION
The applicability test was conducted for one academic library’s Facebook service using the modified E-S-QUAL instrument. Although this study provided a limited amount of data, statistical analyses presented statistically significant results to address part of the research questions. Implications of the findings are discussed.

First, the results of reliability and validity tests support that the modified E-S-QUAL measured four different constructs of the service quality of a library’s Facebook service consistently. However, the predictive validity showed that the relationships with criterion variables were weak. Survey respondents might give answers with high or low scores rather than give honest answers, and/or it might not be appropriate to measure perceived value and loyalty intentions because respondents might have little usage experience with the library’s Facebook service. More data and analysis will be necessary. User comments identified that some survey respondents confused the wording “library information.” Further modification will be required for those statements to make users understand them clearly.

Second, some relatively unimportant items were identified in this study result. These items might be less important than the others in this particular library’s Facebook service, or those might not be critical to measure the service quality of a library’s social media so that they could be ignored. My next study will analyze further this issue in different service settings.

Third, the primary obstacle was the response rate. In this study, the number of valid responses, 88, is small. One of the statistical analyses is factor analysis, which requires a larger sample size. Comrey and Lee advised that a sample size for factor analysis of 100 is poor, 200 is fair, and 300 is good. However, MacCallum et al. emphasized that the level of communalities is a more critical aspect to determine good discovery of factors rather than the exact sample size. The authors recommended that communalities be over 0.5 in the variables. If the values are less than 0.5, the sample size must be over 100. According to Bruin, the sample size for this proposed study is required to be over 320. However, the level of communalities in this study is from the lowest 0.662 (EFF8) to the highest 0.926 (SYS4), which is high enough based on MacCallum et al. Based on research related to survey sample size, the desired response sample size for the modified E-S-QUAL instrument is approximately 300.

CONCLUSIONS
This study introduced the modified E-S-QUAL instrument which evaluates online service quality of social media in the library field. The applicability test of one academic library’s Facebook service confirmed that the four factor structure and the modified statements were applicable in the library service quality evaluation by actual users. The study results are limited to one library’s Facebook service. Therefore, the modified E-S-QUAL’s psychometric properties need to be tested and validated further in other social media services in different academic library contexts in order to arrive at a more comprehensive assessment of the validity of the modified E-S-QUAL. Both more data collection and more comprehensive data analysis are required to determine how thoroughly the study will be able to address the research questions.

The study results will be useful to service managers for library practice. Results using the modified E-S-QUAL instrument to measure service quality help to understand the impact of their use of social media and help to avoid any service errors and increase efficiency. In addition, the use of this instrument will help to explain the rationale and direction for using social media, and to ensure that their efforts are dedicated to worthwhile pursuits.

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NOTES

3. The authors’ investigation in March 2014.

4. The average number of Facebook users was 1,039.3, while the maximum was 6,802. The average number of Twitter users was 1,109.5, while the maximum was 12,249.


9. Xia, “Marketing Library Services through Facebook Groups,” 469.


18. Choi, “Is Your Library Ready for a Social Media Librarian?”


32. Ibid.

33. Ibid., 214.

34. Ibid., 224.


51. Ibid., 159.

52. Ibid., 159.


57. Bruin, “Newtest.”

Over the past two years the staff at the Institute of Museum and Library Services (IMLS) has worked closely with chief officers of state library agencies and staff of the State Library Administrative Agencies (SLAAs) on a new initiative to fundamentally shift project-based reporting for this 230 million dollar Grants to States program. This multi-year planning and technical assistance effort was designed with two major goals in mind. The first goal is to increase the informational value of the Grants to States program reports. The second goal is to help build a stronger library service community by sharing data on effective practice at the state and local level. With over 2,500 project reports recorded each year, the annual State Program Reports produce a compendium on 21st century library service programing. The State Program Reports are a massive repository of project summaries, presenting a unique opportunity to compare, contrast and evaluate how library services are delivered in different settings across the country. Unfortunately, the information reported on an annual basis in the State Program Report lacked standardization, making it difficult to compare basic attributes of one state’s project to the next, even when the agencies supported very similar activities. To address this problem and to encourage use and analysis of the information, IMLS worked closely with SLAAs to develop a new reporting system for the program. Using a communicative planning approach, with over 70 planning workshops involving representatives from each state library agency, IMLS and the SLAAs developed a core set of logic models to both describe program activity and to help identify a limited set of measurable outcomes that could be reported consistently across the states. The new, more consolidated reporting framework is designed to reduce the reporting burden by focusing data collection on a limited set of project outcomes that can be compared across projects over time and across state boundaries. This new system, which is now being piloted by 16 states and will be rolled out to all SLAAs in the summer of 2014, will allow for more systematic comparisons of program characteristics than ever before, including: programming mode and duration, staffing allocations, services rendered, resources purchased, location of programming, characteristics of participants, and more. Redesigning the program reporting system provides IMLS and the states with a more efficient way to capture lessons learned through the Grants to States “laboratory” and to leverage the information to support ongoing assessment to identify and nurture effective practices. Standardization of data will also make it easier for SLAAs to benchmark their program investments. This presentation provides an overview of the planning process, review of the data schema for the new reporting tool and a preview of the public site for Grants to States projects.

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Iterative Chat Transcript Analysis

Steve Baumgart, Erin Carillo, and Laura Schmidli
University of Wisconsin–Madison, USA

Abstract
University of Wisconsin–Madison librarians initially analyzed chat transcripts from the fall of 2010, looking for librarian behaviors associated with patron satisfaction. These behaviors include listening to and understanding patrons’ needs; inviting patrons to use the service again; and providing instruction and/or completing a search for patrons. Analysis of the chat transcripts included establishing a coding schema, applying these codes to each individual chat transcript, and analyzing these codes across the corpus of transcripts for frequency and correlation with other codes. The current analysis uses chat transcripts from the fall of 2013 and seeks to compare any changes in librarian behavior over time, and to gauge the success of establishing best practices and improving training standardization over the last three years. Additional recommendations for librarian behavior, future directions for analysis and a review of the iterative process are included.

Introduction
Twice each year, UW–Madison campus libraries participate in a public service data gathering week, where each library is encouraged to record all public service interactions. These “sweeps weeks” occur during the eleventh week of the fall semester, and the seventh week of the spring semester. They generate a corpus of chat interactions, which are recorded and retained. In 2010, the library’s Reference Assessment Working Group decided to experiment with analyzing this data set to assess the quality of our campus reference services.

The Reference Assessment Working Group is composed of three to six librarians from different libraries on campus and is charged with coordinating each “sweeps week” and reporting about this data twice per year. This group decided to analyze chat transcripts in order to better contextualize and add qualitative data to this report. For the analysis the group used chat transcripts from the general campus queue, which is the main point of entry into chat for University of Wisconsin–Madison users. The main goal of this analysis was to discover patterns of librarian and patron behavior, particularly as our chat reference service had become increasingly busy over the previous years.

While this first analysis using 2010 chat transcripts included twenty-eight codes indicating a variety of behaviors, the main focus of the analysis was to identify and measure librarian behaviors associated with patron satisfaction, as identified in a 2007 study at the University of South Florida. This focus was retained even as the coding schema was simplified for the 2013 iteration.

Methodology
Text transcripts of chat interactions from the general campus library chat queue that occurred in the eleventh week of the fall semester, between November 4 and 10, 2013, were used in this analysis. A similar analysis was conducted in 2010, also using general queue chat transcripts from the same week of the fall semester, from November 7 through November 13, 2010.

Preparing transcripts for analysis involved downloading transcripts from our chat software, converting transcripts to text files, and stripping transcripts of any identifying information. The transcripts were then individually imported into R using the RQDA package, an open-source statistical analysis software program, which was pre-loaded with all codes to be used in the analysis.

The analysis was conducted by four graduate students in the School of Library and Information Studies at three different campus library locations. Prior to beginning to apply codes, these students participated in a one-hour group training and calibration session with the three librarians leading the analysis. Student coders also had access to a screencast tutorial and were oriented to the software and process at their individual library.
In order to establish inter-rater reliability scores for each code, one of the principal investigators separately coded ten percent of the transcripts, which were compared to those coded by students. Cohen’s kappa\(^2\) was used to establish levels of reliability at the file and code levels in both the 2010 and 2013 analyses. The file level Cohen’s kappa values ignores the frequency of codes, and views a transcript as either tagged or not tagged with a specific code. The code level Cohen’s kappa values takes the frequency of codes into account, but was not used in this analysis.

As in our previous analysis, we used common thresholds for Cohen’s kappa\(^3\) to interpret the meaning of magnitude, establishing a four-part scale including: poor (Cohen’s kappa < 0.20), moderate (between 0.21 and 0.40), good (between 0.41 and 0.80) and very good (Cohen’s kappa > 0.80). These values are represented in Figure 1 using orange dots, where dots higher on the y-axis represent a higher level of agreement.

Codes applied in the analysis were based upon those used in our previous 2010 analysis. Twenty-eight codes were used in the previous iteration, which seemed to be overly-complicated based on relatively low levels of inter-rater reliability. For the 2013 analysis, the principal investigators decided to simplify the coding schema. First, codes that correlated strongly with user satisfaction, according to both the RUSA guidelines\(^4\) and the 2007 Kwon and Gregory study, were retained. Remaining codes with the lowest levels of reliability in the 2010 analysis were then examined, and either scope notes were improved or the codes were combined into larger, simplified categories. Finally, codes that were no longer relevant were eliminated. This process resulted in fourteen codes that were applied to our 2013 chat transcripts. The codes are outlined in details in Appendix A: Coding Scope Notes.

Results
In total, 403 chat transcripts were analyzed, with a confidence level of 95 percent. Fourteen codes were applied to these transcripts in the 2013 iteration. All codes are shown in Figure 1 below.

Codes were organized into four categories, based on their inter-rater reliability scores: very good, good, moderate and poor. Codes classified within the poor category, with Cohen’s kappa scoring of less than 0.20, were not considered usable in this study.

Codes with very good reliability, shown in Figure 2, indicated that librarians: greeted the patron (greeting), gave their name (name_librarian), gave the name of their library (name_library), and asked patrons to use the chat service again (comeback_again). The code that identified problem transcripts also had very good reliability between coders. This included transcripts that indicated technical difficulties, were incomplete, or included inappropriate patron behavior.
Codes with good reliability, shown in Figure 3, indicated that librarians listened to patrons, asked clarifying questions and generally checked to make sure they understood the patron question (*listening_and_questioning*), and referred the patron to a different service point (*referral_services*). The code *initial_question* also had good reliability. This code was used to mark the patron’s initiating question or problem that prompted the chat interaction.
Codes with moderate reliability, seen in Figure 4, indicate that librarians: provided instruction to patrons on how to complete a task (instruction), and searched for patrons (searching_for_patron). The code library_specific also had moderate reliability and was used to mark patron questions requiring specific knowledge from a subject specialist or specific library.

Codes with poor reliability cannot be used to draw meaningful conclusions and are shown in Figure 5. These codes were applied inconsistently between coders, and include those that designate librarians checked on a patron’s progress or acknowledged their own progress toward answering a question (maintain_contact), or referred patrons to another mode of reference service, such as e-mail.
or in-person services (*referral_mode*). The code *explicit_compliment* also had poor reliability, though this is of less concern as it was primarily intended to flag patron comments to be used in marketing.

**Figure 5: Percent occurrence of codes with poor inter-rater reliability in 2013**

Codes that are highly correlated with user satisfaction and have acceptable levels of reliability were also separated out, shown in Figure 6. These include codes that indicate that librarians listened to patrons, asked clarifying questions and generally checked to make sure they understood the patrons’ question (*listening_and_questioning*), asked patrons to use the chat service again (*comeback_again*), provided instruction on how to complete a task (*instruction*), and searched for patrons (*searching_for_patron*).

**Figure 6: Percent occurrence of codes with acceptable inter-rater reliability that influence user satisfaction in 2013**

Finally, only one code associated with user satisfaction had poor reliability and cannot be included in this analysis, *maintain_contact*. This code indicates that a librarian checked on a patron’s progress or acknowledged their own progress toward answering a question. This code
will need to be improved in order to be used in future analyses.

Discussion
The purpose of this analysis was to build upon the previous analysis, examining how the 2010 analysis and accompanying report may have changed librarian behaviors. We are specifically interested in charting those behaviors over time that correlate with user satisfaction, as well as examining how often subject-specific questions occur over chat, and how often chat questions are referred to other service points and modes of contact. Our focus in identifying these behaviors is to improve training and update best practices, as needed, to ensure user satisfaction in the future. Finally, we also had an interest in improving our coding process in terms of efficiency and inter-rater reliability, possibly serving as an example to other groups on campus interested in qualitative analysis.

Codes Eliminated for the 2013 Analysis
In 2010, we analyzed both how often patrons gave their names, and how often librarians used patrons’ names. We chose not to track this behavior in the current analysis, as this behavior is relatively rare and not correlated with increased user satisfaction. We also coded transcripts in 2010 that contained questions of a general nature that can be answered by a majority of librarians, in order to mark questions that were appropriate for our general chat queue. In 2010, over 83 percent of transcripts received this tag. For the 2013 analysis, we decided it was more important to only mark questions that inversely required specific subject-area knowledge, or knowledge specific to a library location. Our main interest lies in charting how often these questions requiring specialized knowledge occur, and how often they are referred from our main service point. In the 2013 iteration, this is indicated by the code library_specific.

The 2010 analysis also recorded transcripts where the librarian was polite or encouraging, where the librarian ends the chat with a closing other than inviting the patron to chat again, where the patron thanked the librarian, and where the patron was dissatisfied or their question was unanswered. These four codes all had relatively low inter-rater reliability in the 2010 analysis and were not correlated with patron satisfaction. All four were eliminated from the 2013 iteration.

Codes Added for the 2013 Analysis
Only one entirely new code was added for this analysis. The code initial_question was added to the schema in order to mark patrons’ initial questions or the problems that prompted them to contact the chat reference service. We anticipate doing further analysis on these initial questions separately, in order to identify common problems and questions, or “pain points.” Knowledge of the specific issues for which patrons contact us may help to improve services in other areas, for example, improving instructions available on our website.

Analysis of Code Frequency
For each code applied to the transcripts, we calculated inter-rater reliability scores, and also the frequency with which it was applied to our transcripts. Within the subset of codes with acceptable levels of reliability (Cohen’s kappa > 0.40), there are five codes that were applied to more than half of the transcripts, as seen in Figure 7. These represent the five most common desirable behaviors exhibited by librarians via chat. Librarians greeted patrons in 87 percent of interactions, searched on behalf of patrons in 72 percent of interactions, engaged in listening and questioning behaviors in 64 percent of interactions, and stated their name and their library’s name in 59 percent of interactions. Three out of five of these behaviors occurred more often than in our previous analysis. The remaining two codes are unfortunately not directly comparable with our 2013 codes, as these two codes consolidated codes used in the 2010 analysis. The 2013 code listening_and_questioning combined the 2010 codes check_on_success, open Ended questions, rephrasing, and clarifying_or_closed_questions. The 2013 code searching_for_patron combined this same code in 2010 with url_other. For a full list of codes used, and comparison to codes used in 2010, see Appendix A: Coding Scope Notes.
Most notable in these commonly applied codes from 2013, is that librarians identified both themselves and their library far more frequently than in 2010. This is also one of four librarian behaviors that is highly correlated with patron satisfaction. The increase in this behavior demonstrates that emphasis placed on this identified best practice through training and documentation after the 2010 analysis has had a positive impact on librarian behaviors. However, as best practices, these behaviors should ideally be occurring in more than fifty-nine percent of interactions. There is still room for improvement.

The code instruction in the 2013 analysis also combined two codes from the 2010 analysis: instruction and url_jing. As Jing is inherently instructional in nature, these two codes were combined for the 2013 analysis. Similarly, use of non-Jing URLs by librarians was no longer explicitly tracked, but often occurred in conjunction with searching for a patron, coded with searching_for_patron, where information was provided directly to patrons. The latter still happens in a majority (72 percent) of interactions. In contrast, instruction occurred within 36 percent of interactions. Similar to the 2010 results, this indicates that librarians are still more likely to provide patrons with information directly over chat, rather than teaching patrons how to obtain that information, which is likely a result of the chat medium. This relationship can be seen in Figure 8, which shows the breakdown between these two codes. While a significant number of interactions were coded with both codes (35 percent), an additional 42 percent of interactions were only coded with searching_for_patron and not instruction. While both of these librarian behaviors are correlated with user satisfaction, they do represent different philosophies of reference service. This may be an area for future analysis.
In 2013 there was an increase of over eight percent in librarians encouraging patrons to use the service again, denoted by the code `comeback_again`, as seen in Figure 9. However, this code was only present in 21 percent of all transcripts. As this librarian behavior is highly correlated with patron satisfaction, there is room for improvement. While there are specific situations where this is difficult, for example if a patron leaves the conversation abruptly, in many chat interactions it can be added to librarians’ typical chat closing.

Finally, in the 2013 analysis as compared to 2010, approximately the same percentage of referrals to other service points were recorded. There were approximately five percent fewer transcripts coded as being best answered by specific libraries or subject specialists in 2013. This data is shown in Figure 10. This indicates a decrease of over five percent in questions marked as library-specific or best answered by subject specialists, and no decrease in referrals. The decrease in library-specific chats may be related to the establishment of additional subject-specific chat queues between the 2010 and 2013 analysis. The fact that referrals have remained constant despite a decrease in library-specific questions may indicate an increase in collaborative work among librarians at different libraries. Refining our coding in the future may be needed to more accurately analyze these behaviors.
As seen in Figure 11, only fifteen transcripts were coded as **library_specific** (three percent), with only five (one percent) of those also coded as **referral_services**. Though these numbers are relatively small, this does bring into question how many subject- or library-specific questions are being referred appropriately. We reviewed these individual transcripts a second time to look for situations where a referral was appropriate, but not made. In almost all cases, the specific question was adequately answered by the librarian on chat, and thus not referred. In a few cases, the chat was incorrectly tagged. While we did not uncover missed opportunities for referrals, we did find some ways to refine our coding schema in the future. Namely, we need to explicitly determine appropriate coding for the following situations: where a patron asks for a librarian by name, where a librarian refers a patron to an entity outside of campus, and where a librarian is testing or demonstrating chat services.

Finally, it is important to recognize that while our total sample gives a confidence of 95 percent, both of these codes have only moderate inter-rater reliability. By improving our coding definitions in the future, we hope to improve the reliability of these codes in future analyses.
Analysis of Inter-rater Reliability
Overall, inter-rater reliability for the 2013 analysis has improved from 2010. Five out of fourteen codes (36 percent) exhibited very good agreement, three out of fourteen (21 percent) exhibited good agreement and 3 out of 14 (21 percent) exhibited moderate agreement. Overall, 11 out of 14 codes (79 percent) in the 2013 analysis were of moderate, good, or very good reliability. Only 75 percent of codes were of the same reliability in the 2010 analysis, as seen in Figure 12.

Figure 12: Inter-rater reliability seen as Cohen’s kappa values over time

Only one code that correlated to user satisfaction had poor agreement and was unusable. Two additional codes exhibited poor agreement, but are not correlated to user satisfaction and thus not considered critical codes. This code comparison can be seen in Figure 13.
We attribute the overall improvement in inter-rater reliability of the 2013 codes to several factors. First, we conducted more comprehensive training and held a group session with all student coders in order to ensure everyone understood and was able to apply our codes. This session resulted in some minor adjustment of coding scope notes in order to make them more sensible for students to apply. We also used fewer individual student coders for the 2013 analysis, and chose graduate students from the SLIS program in paid library positions, with the rationale that these students would have an improved work ethic and commitment to the analysis. Finally, we drastically simplified the codes used by combining, simplifying and eliminating codes from the 2010 analysis.

However, even with these improvements, three codes out of fourteen had low levels of reliability. The code `explicit_compliment` is intended to mark out patron comments that may be useful in future marketing or promotional materials, and thus reliability is not extremely important for this code.

The code `referral_mode` is not correlated with patron satisfaction, but is important in order to know the frequency with which our librarians refer patrons to alternate forms of communication with a librarian (e.g., phone, e-mail, and in-person). During our one-hour training session, our coding group did discuss this code, and decided that it should be used to identify situations where chat does not work to answer a question, but not in cases where supplementary material is provided through another mode (e.g., when an article is delivered via e-mail in conjunction with chat instruction). One coder noted that, “Most librarians were able to use Jing or guided instruction, giving the students lots of time and patience even when questions were more challenging. I felt that this reflected that librarians are more comfortable with online interfaces and are able to give quality reference via chat.” This is a positive observation, but further analysis should be done to determine why the inter-rater reliability is so low for this code.

The code `maintain_contact` is correlated with patron satisfaction, and exhibited poor levels of inter-rater reliability. One factor noted by coders that made this code difficult to apply is that timestamps were not included in the chat transcripts. This reduced the context coders had in deciding to apply this code. One possible solution would be to include timestamps in future analyses. Another is to separate out the two parts of this code, using one to indicate when librarians check on patron progress, and second to indicate when librarians update patrons on their own progress. However, this code was also problematic in our 2010 analysis, and at that point solely indicated when librarians updated patrons on their own progress.
These latter two codes, referral_mode and maintain_contact, should be improved upon in the future. We intend to work further with student coders to re-examine our scope notes and training examples.

Finally, we intend to have a principal investigator code a larger portion of the transcripts in future analyses, in order to more accurately gauge inter-rater reliability. In our small sample size, we found that reliability was easily skewed with our current practice of coding ten percent of transcripts for comparison.

**Summary**
The 2013 analysis again focused on evaluating the frequency of best practices in providing chat reference services. Librarian behaviors have improved, likely in response to improved training and awareness as a result of the 2010 analysis. However, there is still room for improvement, specifically regarding librarians providing their name and the name of their library, providing instruction in conjunction with searching for patrons, and inviting patrons to come back to use the service again.

Additionally, the investigators have improved upon the analysis process, and have identified further areas for improvement including coder training and code design. The methods outlined in this report may serve as an example to other units interested in conducting qualitative analysis in the future.

Finally, we plan to conduct a further analysis in the future based on the initial_question code, as outlined in the discussion section of this report. This will identify difficulties that most commonly prompt patrons to initiate chat interactions. We are also in the process of further investigating the correlation between codes related to subject- and library-specific questions and referrals. We will release any recommendations based on this analysis promptly.

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**Notes**


# Appendix A: Coding Scope Notes

<table>
<thead>
<tr>
<th>Name</th>
<th>Memo</th>
<th>Changes from 2010</th>
<th>Notes/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>comeback_again</strong></td>
<td><strong>Scope:</strong> librarian</td>
<td></td>
<td>Correlates with RUSA guideline 5. Follow-up. Influences patron satisfaction (Kwon &amp; Gregory, 2007)</td>
</tr>
<tr>
<td></td>
<td><strong>Use:</strong> times when the librarian invites the patron to return.</td>
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<td></td>
<td><strong>Examples:</strong></td>
<td></td>
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<tr>
<td></td>
<td>If you have any further questions, please let us know.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>explicit_compliment</strong></td>
<td><strong>Scope:</strong> patron</td>
<td>Changed name (was compliment)</td>
<td>Tracked for marketing</td>
</tr>
<tr>
<td></td>
<td><strong>Use:</strong> When the patron provides a compliment to the service after they have received a response from the librarian. This goes beyond the normal politeness that may occur during transactions.</td>
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<tr>
<td></td>
<td><strong>Example:</strong></td>
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<tr>
<td></td>
<td>You rock!</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Great service!</td>
<td></td>
<td></td>
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<tr>
<td><strong>greeting</strong></td>
<td><strong>Scope:</strong> librarian</td>
<td></td>
<td>Correlates with RUSA guideline 1. Approachability</td>
</tr>
<tr>
<td></td>
<td><strong>Use:</strong> When a librarian greets the guest at the start of a chat interaction.</td>
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<tr>
<td></td>
<td><strong>Examples:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hi</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Hello</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>How can I help?</td>
<td></td>
<td></td>
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<tr>
<td>Name</td>
<td>Memo</td>
<td>Changes from 2010</td>
<td>Notes/Comments</td>
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<td>-------------------------------------</td>
</tr>
</tbody>
</table>
| initial_question| **Scope:** patron  
**Use:** Mark the patron’s initial question that prompted the chat interaction.  
**Examples:**  
I’m having trouble finding this journal article  
What are your hours today? | New for 2013        | For later coding, looking for “pain points” |
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<th>Name</th>
<th>Memo</th>
<th>Changes from 2010</th>
<th>Notes/Comments</th>
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</table>
| instruction | **scope**: librarian  
**Use**: When the librarian gives the guest information on how to do a task. If there are more than one direction given in sequence highlight the entire sequence and count it as a single instance. This even includes if the sequence is contained in more than one line or response. This includes when the librarian supplies a video or screenshot for a guest, or indicates that they are walking the guest through the steps of searching while simultaneous searching with the guest. In this case, also use **searching_for_patron**.  
**Examples:**  
Librarian: Click on the FindIt button.  
Librarian: I’m going to the database tab and search for Academic Search.  
Guest: Let me go where you are.  
Librarian: Once you are there click on the database name and then search for: clowns and noses.  
Guest: Great I’m there.  
Librarian: Do you see the 3rd article down?  
Guest: Yes! | Combines **instruction**, **searching_with_patron**, and **url_jing**                                                                 | Correlates with RUSA guideline 4. Searching. Influences patron satisfaction (Kwon & Gregory, 2007) |
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<th>Memo</th>
<th>Changes from 2010</th>
<th>Notes/Comments</th>
</tr>
</thead>
</table>
| library_specific   | **Scope**: patron  
**Use**: When a question asked by a patron requires specific knowledge likely better answered by a subject specialist or a specific library. These will be highly technical questions, or involve specialized literature types or software (e.g., laboratory protocols, patents, standards.)  
**Examples**:  
Do you have ASCME standard 1234?  
Someone is making too much noise on the second floor of Steenbock.  
I have to find articles related to marketing data for these new widgets. |                   |                 |
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<th>Memo</th>
<th>Changes from 2010</th>
<th>Notes/Comments</th>
</tr>
</thead>
</table>
| listening_and_questioning   | **Scope**: librarian  
**Use**: Librarian checks on whether they have sufficiently helped the patron, asks clarifying questions, or rephrases the question or request and asks for confirmation to ensure that it is understood.  
**Examples**:  
Did this answer your question?  
What type of information do you need (books, articles, etc.)?  
So you are looking for articles on the gestation period of Tibetan yaks? | Combines check_on_success, clarifying_or_closed_question, open Ended_questions, rephrasing | Correlates with RUSA guideline 3. Listening/inquiring.  
Influences patron satisfaction  
(Kwon & Gregory, 2007) |
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<th>Changes from 2010</th>
<th>Notes/Comments</th>
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</table>
| maintain_contact | **Scope:** Librarian  
Use: When the librarian leaves for a time and then returns acknowledging that they are working on the question or are back, and when the librarian indicates to the guest that they are still working on a question or thinking about the question. This may also be used when librarian checks in with the patron’s progress. This differs from **listening_and_questioning**, which is used when the librarian is trying to clarify the patron’s needs.  
**Examples:**  
I’m back.  
I’m still working on it.  
I’ll be back in a second.  
How are you doing? | Combines **focus_on_patiotn**, **maintain_contact** |                                           |
| name_librarian  | **Scope:** librarian  
Use: When librarian give their name. Usually this will be indicated in the chat as [name omitted]  
**Examples:**  
Hi this is [name omitted] at [library omitted] library |                                           |
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<th>Name</th>
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<th>Changes from 2010</th>
<th>Notes/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>name _library</td>
<td><strong>Scope:</strong> librarian</td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Use:</strong> When librarian gives the name of their library. Usually this will be indicated in the chat as [library omitted]</td>
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<td></td>
</tr>
<tr>
<td></td>
<td><strong>Examples:</strong> Hi this is [name omitted] at [library omitted] library</td>
<td></td>
<td></td>
</tr>
<tr>
<td>problem</td>
<td><strong>Scope:</strong> Applies to entire transaction</td>
<td></td>
<td>Combines <strong>abrupt</strong> and <strong>inappropriate</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Use:</strong> If the transaction ended abruptly, indicating technical difficulties. Tag the last word in the document.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>scope:</strong> patron</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Use:</strong> when the patron asks an inappropriate question, makes a crude or rude remark.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Examples:</strong> Will you go out with me later?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Memo</td>
<td>Changes from 2010</td>
<td>Notes/Comments</td>
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<td>-----------------------------------------------</td>
</tr>
<tr>
<td>referral _mode</td>
<td><strong>Scope</strong>: librarian</td>
<td></td>
<td>Correlates with RUSA guideline 5. Follow-up</td>
</tr>
<tr>
<td></td>
<td><strong>Use</strong>: When the librarian refers the patron to another mode of communication in order to better serve them.</td>
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<tr>
<td></td>
<td><strong>Examples</strong>: I think that you should come into the library where we can better serve you. It would be better if you call us at xxx-xxxx. I can reply by e-mail more easily.</td>
<td></td>
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<tr>
<td>referral _services</td>
<td><strong>Scope</strong>: librarian</td>
<td></td>
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<tr>
<td></td>
<td><strong>Use</strong>: When the librarian refers the guest to another service point in order to better serve them. Don’t use if the patron directly asks about a particular library; in that case, use <strong>searching_for_patron</strong>.</td>
<td></td>
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<tr>
<td></td>
<td><strong>Examples</strong>: I think that you will better if you contact the business library directly. Wendt Library will be able to better help. Here is their contact information. Please call the Circulation Office at XXX-XXXX. ILL is on chat, I will transfer you to them now.</td>
<td></td>
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<tr>
<td>Name</td>
<td>Memo</td>
<td>Changes from 2010</td>
<td>Notes/ Comments</td>
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<tr>
<td>searching_for_patron</td>
<td><strong>Scope:</strong> librarian</td>
<td>Combines searching_for_patron and url_other</td>
<td>Correlates with RUSA guideline 4. Searching. Influences patron satisfaction (Kwon &amp; Gregory, 2007)</td>
</tr>
<tr>
<td></td>
<td><strong>Use:</strong> Librarian gives the answer to the patron or indicates they are searching for them. This may be used in conjunction with instruction if instruction is given before or afterwards. Also use with instruction if patron indicates they are following along.</td>
<td></td>
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<tr>
<td></td>
<td><strong>Examples:</strong></td>
<td></td>
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<tr>
<td></td>
<td>Hang on. Let me check on that.</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>I found this: <a href="http://someurl.com">http://someurl.com</a>.</td>
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Completing Assessment Projects when it is Only Part of my Job

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Introduction
Few of us work as fulltime researchers, yet assessment is essential to better understanding our users and their needs. This panel featured speakers from three institutions—Cornell University, the University of California, Los Angeles (UCLA), and the University of Virginia—engaged in graduate student-centered assessment projects. Each speaker briefly discussed his or her project; the ensuing panel discussion built on the context of these projects and centered on some common issues; and challenges and benefits. For example, when assessment is not one’s only job responsibility, how do the demands of an assessment project fit into the rhythms and requirements of the academic year? Given the time constraints of librarians pulled in multiple directions, is investment in large-scale assessment beneficial? The panel discussion was not recorded, but the topics discussed are addressed in each project’s section.

The North Campus Research Community Study (NCRCS) at UCLA
At UCLA, a team of five librarians is analyzing data from a mixed methods assessment project that includes a survey, behavioral observation, interviews, and focus groups; the goal is to better understand research support needs of graduate students in the humanities and social sciences, in order to strategically develop library services and spaces. This work was prompted by a partial renovation of the Charles E. Young Research Library, which opened in September 2011. Preliminary results of the NCRCS study were presented at the 2013 ACRL Conference in Indianapolis and a grant allowed continuation of data collection through June 2014.

The Research Library is one of the two largest of the 10 UCLA Library locations on a campus of over 28,000 undergraduates and over 13,000 graduate students—approximately 3,500 of them in the North Campus disciplines of arts, humanities, social sciences, and area studies. The Research Library had been the traditional hub of graduate students in those disciplines.

With the renovation and addition of a café, research commons, and new, comfortable furniture, undergraduate students began to flock to the building as never before. Frustrated graduate students told librarians that they were being pushed out of their space and that these new spaces did not meet their needs. The new Research Commons was particularly challenging; created for group work, it appeared to be used primarily as a study hall. And while there were lovely new spaces on the first floor, the stacks—with most of the individual workspaces—still looked much as they had in the 1960s.

We began to realize that more data were needed to strategically (and successfully) program the new spaces and evolve library services to support graduate students on North Campus. We formed a small research team of subject librarians in the humanities, social sciences, and area studies to look at these issues. We brought different skill sets and experience to this project, which was both a benefit and a challenge, as we will discuss later.
In early 2012, there was little published about graduate student support, so we felt a larger-scale project was a good choice. Our study included multiple modes of data collection to learn about graduate student support on campus in general, students’ use of the library, and training for research and teaching. I was designated the project manager, due in part to assessment being part of my job description. We broke the study in two phases, but this still was an ambitious undertaking. One of our focal areas of inquiry was group work; we had a new space for it, but did students really need or use it?

Our questionnaire (in SurveyMonkey) asked about general library usage to give a baseline of student habits. We received 277 responses, 111 of them graduate students. Responses indicated that while about half the graduate students did group work, the other half did not. To document group work (or the lack thereof) in the Research Commons, we conducted behavioral observations three times per day, for a selection of days throughout the fall quarter. We counted the number of students in each pod or study room, and noted whether they were working alone or in groups. Headcounts throughout the building documented usage outside of the Research Commons. The observational data was extremely useful, but very labor intensive to gather.

We asked faculty members how they trained graduate students for research, as well as their impressions of student needs and support. The faculty comments provided a point of comparison when we later spoke with students. Faculty indicated that graduate students enter with a wide range of skill sets and curricula do not always account for this difference. Group assignments and modes of scholarship vary widely across disciplines. For some, group work means an advisory study group, while for others it is completing an assignment together. Faculty also highlighted the discrepancy in resources related to space (and funding) for students. Some departments have reading rooms and labs; others have little more than a lounge. We also noted differing opinions towards non-traditional scholarship and support for digital skills. When asked, faculty said that digital skills made students more attractive job candidates, but the students were expected to acquire those independently.

Main focus group themes related to space, teaching training, writing and presentation skills, and communication. We grouped students based on status within their programs, rather than by subject area, and although we aimed for a group size of 6–10, there were often fewer. We included advanced undergraduates because we suspected they share common needs with beginning graduate students.

The number of students on campus means space is always at a premium. While some, but not all, PhD students are provided with offices by their departments, many are shared or not productive spaces (i.e., a closet-like space inside an advisor’s office); master’s students (and advanced undergraduates) do not get a workspace at all. Many who were intensively writing (dissertations, but also undergraduate honors theses) talked about needing a lot of materials and space to spread out; they were more productive at home or had to strategize about what to bring to campus. Students highlighted their tightly scheduled days on campus and the need to be efficient with their time.

In regard to teaching, some students entered with experience, but many felt thrown into classrooms without adequate guidance. From the interviews, it was clear that faculty focus their energies on creating productive researchers (publishing and finding funding/writing grants). This makes sense at a research university; at a liberal arts college, responses would likely be quite different. UCLA has an Office of Instructional Development that offers TA training programs; faculty may assume teaching training is handled by them.

Given what we have learned over the past few years, we have already made some changes and are advocating for others, especially those related to space. One change introduced in fall 2013 is a reservation system for the Research Commons that gives priority to graduate students; this summer a colleague is piloting a teaching institute for graduate students; and we are working to improve marketing of existing services.

Sharing our findings with our colleagues and other campus stakeholders has promoted awareness, but also created challenges. During meetings with library administration and with representatives from Capital Projects, both groups expressed interest in data we did not collect—information
about the entire campus and about change since we started. They often seem to be seeking a single approach with a big impact, but what we have learned is that for graduate students many different approaches are required.

Beyond the findings themselves, we have learned a lot about how to do this type of assessment, for example, how to better design a survey and the importance of marketing. Project coordination was a challenge; all team members have subject liaison requirements and some, additional administrative roles. Balancing the demands of research with the requirements of other job functions, along with limited experience in social science research methods, caused unanticipated delays and difficulties. Time-sensitive work for collection development and instruction, as well as event planning, would stall progress; gaps between work-periods required more review of work already completed so that everyone could remember where we left off. As the project manager, it fell to me to keep the rest of the team on track and the project moving forward. Our differing backgrounds became more challenging in the data analysis phase; there were many stories that the data could potentially tell, and we did not have the resources to explore them all in rigorous detail. Everyone had slightly different goals and expectations; it was hard to agree on an approach that was achievable with our resources. Nonetheless, what we have learned has been extremely enlightening and gives us data to use when advocating for change, an essential tool in an increasingly data-driven climate.

The University of Virginia: Assessing the Research Needs of Graduate Students 2008–2013

Background

The University of Virginia (U.Va.) is a medium-sized research institution with an emphasis on the liberal arts. The U.Va. Library has a strong commitment to assessing user needs and user activity and encourages library staff to engage in research. In 2006, the library created the User Requirements/Usability Committee (UR/U). In the summer of 2008, members of UR/U conceived of a project to better understand the research habits and research needs—really, the overall research life cycle—of graduate students, whom we perceived as an underserved group. Our research team was composed of one librarian from Alderman Library, the library for the humanities and social sciences, and three librarians from the Brown Science and Engineering Library. Our primary duties were as public services librarians, and none of us had experience in assessment beyond our involvement with the UR/U Committee.

Methodology

We surveyed the existing literature on graduate research habits, and discovered a model in Carole A. George, et al.’s “Scholarly Use of Information: Graduate Students’ Information seeking Behaviour.” George and her team of researchers at Carnegie Mellon University explored graduate students’ information-seeking behavior through semi-structured interviews. They drew a large sample of 100 students: “to represent every department with at least two students (larger departments would have more).” They transcribed the interviews and “coded [responses] into meaningful categories using the qualitative data analysis software, Atlas.ti.” They assigned two members of the team to code each interview and compared a sample of the interviews to check for consistency between the coders. They “asked general questions rather than specific to get a better idea of the participants’ behavior, thoughts and feelings that affect their information-seeking.” George et al. primarily wanted to understand graduate students’ search for and use of different types of information, including the different people (professors, friends, librarians) who helped point students to particular sources. We closely followed George’s methodology, but because our scope was broader, we asked questions that went beyond information-seeking to explore ways that students used their interpersonal networks to generate ideas and aid in professional development.

By December 2008, we had obtained approval from the Institutional Review Board to conduct the interviews, as well as a grant from the U.Va. Library Research and Development Committee that enabled us to offer incentives to participants, to purchase tape recorders for the interviews, and to secure licenses for NVIVO software so that we could transcribe and code the interviews. During the winter and spring of 2009 we drafted questions and planned the interview protocol. We recruited a number of students proportional to each program in U.Va.’s College of Arts and Sciences, the School of Architecture, the Curry School of Education, and the McIntyre School of Commerce, by asking subject librarians to announce the project to their liaison departments, offering each participant a
$20 Cav Advantage card that could be used at the university bookstore or eating establishments. We wanted to get an even 100 students, but ended up with 96, because we were unable to get even complements of students from some departments (Drama and Asian Studies). The overall disciplinary breakdown of our sample was 46% humanities, 34% science, and 20% social science students.

We interviewed students during summer 2009, following a standard list of questions, but allowing subjects to be as expansive in their answers as they chose; we asked follow-up questions that were partly determined in advance, and partly suggested by the interviewees' own words. Interviews typically ran from 60 to 90 minutes. Two different team members conducted each interview, which ultimately led to some inconsistency in questioning and interpretation.

We began to transcribe the interviews that December. It typically took 4–5 hours to record each interview, and sometimes considerably longer. Our supervisors granted us quite a bit of on-the-job time to transcribe, code, and discuss our findings. However, it was still difficult to find time to work on the project in addition to our other duties and outside responsibilities. (Team members typically taught many sessions of library instruction each semester, as well as working approximately six hours per week on public services desks, handling collection development duties, and working on other projects.) The amount of time that we were able to dedicate to the project varied greatly, from 10–15 hours per week during peaks of interviewing, transcribing, and coding, to “valleys” of 0–2 hours per week when other duties predominated. By February 2011, we had only transcribed 73 of the 96 interviews.

Analysis of the interviews presented challenges because of the length of the interviews, and the fact that different team members had asked different questions. Because the questions were open-ended, there were inevitably gaps in what students mentioned. Terms like “work” and “research” had multiple connotations that were not always carefully parsed by interviewers or subjects. Nevertheless, the 73 interviews that we transcribed gave proportional representation among the different academic disciplines from which our overall sample had been drawn. We observed similar themes recurring in student comments, and we began to code them, identifying nodes based upon our questions, as well as themes that interviewees mentioned independently. We assigned two team members to code each interview, comparing results with the entire team in order to ensure greater consistency. Our process closely resembled the constant comparative method as described by Susan Gardner: “(1) Begin collecting data; (2) Find key issues, events, or activities in the data that become main categories for focus; (3) Collect data that provide many incidents of the categories of focus; (4) Write about the categories explored, keeping in mind past incidents while searching for new ones; (5) Work with the data and emerging model to discover relationships; and (6) Sample, code, and write with the core categories in mind. The steps of the constant comparative method occur simultaneously during data collection until categories are saturated and writing begins.”

Presentation and Publication: Successes and Failures
We presented findings at several different venues, including EDUCAUSE and the Virginia Library Association chapter of the Association of College and Research Libraries (VLACRL) in October 2011. However, we encountered far greater difficulty in focusing on a topic for an article, and self-confidence in our methodological rigor and the reliability of our analysis diminished as we discussed the idea of publication. The sheer wealth of the data was daunting. Qualitative analysis posed a challenge for all members of the team, but especially for those with a science background. Illustrating themes through a series of carefully chosen examples seemed to lack statistical significance, and efforts to identify statistical correlations between the breadth of student networks and student publication rate foundered on the problem of inconsistencies in the interviewing and coding, as well as the fact that we would likely have to work with “a random sample chosen from a non-random sample.” Ultimately, we never wrote up our results for publication.

Updating the Picture: Focus Groups (2013)
Students from several disciplines—especially in the humanities—had expressed a desire for some sort of research training, but it was unclear what form this should take and who should provide it. Our 2011 and 2012 Annual User Surveys had indicated decline in the use of libraries as study space by graduate students (though less so among
humanities students). We wanted to understand more about graduate students’ preferred study spaces. These questions formed the basis for the focus groups we conducted in January and February 2013.

We ran four focus groups: one for social science students, one for science students, and two for humanities students to get proportional representation—39% humanities, 26% science, and 35% social science. A group of five librarians planned the focus groups, including two members of the team that conducted the 2009 study. The entire team was present at each focus group. We had the same note takers at each two-hour session, and all of us examined the notes and suggested corrections or clarifications.

The involvement of the entire team, plus a series of more targeted queries, mitigated some of the problems of inconsistency that had arisen during the interviews. At the same time, there was enough similarity in the questions asked about research training and use of library space (as well as in follow-up questions related to students’ research habits and use of library tools and resources) to the 2009 interviews that the focus groups helped update the picture that had emerged from the original project. We were surprised at how much had remained the same during the intervening four years.

**Overall Impact and Reflection**

Our study had considerable impact within the U.Va. Library. Our colleagues obtained a comprehensive picture of the students’ research needs and habits, including their use (or not) of library services. Findings from the interviews helped influence the design of the Graduate Study Room in Alderman Library that opened in the autumn of 2011 to create quiet—but not solitary—study space dedicated to graduate students. Outreach to graduate students has loomed large in the library’s realignment of services that began in March 2014. A member of the library’s Senior Leadership Team praised the project as a model way of better understanding user needs because of its open-ended questions, which led us to identify needs and possible services that we did not ask about—for example, multidisciplinary interest in archival research (which emerged even more clearly in the 2013 focus groups).

The approach of “collecting activity data broadly, and see what it has to tell us” presents inherent challenges in terms of scope, but is valuable in itself. If we were to undertake a similarly large project, we would more carefully consider ultimate goals and pay closer attention to models. We would aim for speedier analysis of data and timely publication. Therefore, we might draw from a large sample, but focus on a smaller problem set or range of questions. We would also do more reading in qualitative research methods or ethnography, and/or consult with experts in this kind of assessment when planning a study. A more carefully focused study, or getting advice from experts outside the investigative team would probably help to minimize inconsistencies that may arise from having different team members work on different pieces of the study, or disagreements arising from individuals’ different perspectives. Nevertheless, the “naiveté” of our approach is what yielded such a wealth of data and such a comprehensive picture of a user population. A large, open-ended user study can be an exciting and worthwhile experience.

**Cornell University**

At Cornell, a team of librarians worked with partners at Columbia on a collaborative ethnographic user needs study investigating the local needs of doctoral students in the humanities in 2010–2011, specifically the question of whether the library could positively impact their success. The findings of the study informed service and space modifications at both places. The data used for management decisions comprised only a fraction of what the interviews at Cornell revealed, however. Members of the original team examined the interviews again to look for answers to a question that went well beyond the original interview protocol, but had emerged as an important theme—building a community of practice and the potential for libraries as partners in the process.

The original study followed in the wake of a number of major, large-scale studies on the high attrition rates for PhD students in the humanities, including the Council of Graduate Schools PhD Completion Project, the Andrew W. Mellon Foundation’s Graduate Education Initiative, and the National Research Council Assessment of Research Doctoral Programs. The results of these studies reveal a significant gap between the humanities and other disciplines: the number
of doctorates awarded in the humanities has steadily been declining, while those in science and engineering have been increasing; the mean registered time to degree is the longest in the humanities and the completion rate within a ten-year period is the lowest in the humanities.

Our study (which received external funding from CLIR and the Delmas Foundation) consisted of focus groups and interviews with graduate students in the humanities at both Cornell and Columbia. We investigated whether the library could positively impact the completion and retention rates in doctoral work in the humanities, and specific strategies it might employ. Our research questions included:

- At what points in their programs are graduate students in the humanities particularly vulnerable, and can the library intervene during those crucial moments to offer graduate students useful services or spaces?
- How does regular use of library services and collections impact attrition and completion rates?
- Which library services could be envisioned as part of an intervention strategy to reverse these trends? How would such intervention be implemented and measured? What potential partnerships with other campus entities might be beneficial?
- How can the library re-conceive its physical space to provide graduate students from across disciplines with an intellectual sense of community?

The results of the study are presented on the CLIR website.¹⁰

The opportunities for libraries that emerged from the study included results we anticipated, such as offering space, improving access to deep research collections, providing research assistance, and most notably, nurturing the development of scholars through fostering community. In order to examine the latter issue in detail, in 2012, the Cornell team went back to the 21 Cornell interviews and reviewed them again, looking specifically for the threads that pointed to the library as a potential player in the building and fostering community among graduate students, since the examination of the transcripts revealed that socialization and participation in communities of practice are crucial components in the students' ability to acquire the knowledge, skills, and tools necessary to succeed in their doctoral studies. The full results of this second examination of our original transcripts are available in the ACRL 2013 Conference Proceedings.¹¹

In summary, we identified a variety of ways in which libraries can provide support for doctoral students in the humanities. Examples include the provision of neutral meeting spaces outside of academic departments, the promotion of “neutral” librarian subject experts without departmental affiliation, the development and delivery of workshops that appeal to doctoral students across multiple departments (who nonetheless share interests and goals), and the creation of communities through sustained, “immersion”-style programs.

Most of the Cornell team members were novices to ethnographic studies and/or assessment when the original project launched, and assessment was part of the job description of only one of us. As expected, the most salient challenges that the team faced included the substantial time commitment (including the time for training) and the need to fit the project in between every team member’s other job responsibilities. There emerged other, not anticipated, challenges such as the need to conclude the transcript analysis and complete the report in order to meet the funding agency’s requirements, even though the team felt that more time was needed to do justice to the wealth of information contained in the transcripts. This particular challenge led to our decision to revisit the interview material at a later time in order to look at the topic of communities of practice. An additional challenge was presented by the time that the actual transcription took. Originally, we had hired undergraduate students to do the transcription; however, once the analysis was to begin, we discovered that there were entirely too many gaps, inconsistencies, or errors in the transcriptions, which led to more staff time devoted to reviewing all the transcripts and listening to the recordings again to make corrections.

The benefits of the project, however, far outweighed the challenges. Exposing non-assessment staff to opportunities for acquiring new skills and an enhanced understanding of user behavior proved to be not only a positive vehicle for staff and organizational development, but it also increased
the interest in assessment and data-driven decision making among staff. Since the project was supported by the Graduate School, it also provided a vehicle for a deeper engagement with the local academic leadership and the librarians emerged as very active and visible contributors in confronting and solving university-level problems.

Perhaps the biggest benefit of the original project, though, stemmed from the nature of ethnographic research itself. The data we collected were so rich, and varied, as participants in the study meandered through the interview protocol questions to eventually focus on the issues that they considered of utmost importance, that it became not only possible, but in fact, a necessity, to re-use the data and look for threads that had not been part of the original research hypotheses. The opportunities for libraries that we located once we went back to the interview transcripts not only enhanced our understanding of the role research libraries play in the academic life of their communities, but also resulted in practical steps to improve our services to graduate students.

Undoubtedly, re-use of data carries its own pitfalls. Some of the potential challenges include significant changes in the population as time elapses and practices and behaviors change; misconstruing the significance of incidental comments; and potentially overestimating the validity of a secondary analysis of a part of the population for the whole population. In our particular case, we felt fairly confident that we were not falling in those particular dangers of data re-use. The two studies we conducted followed each other within a year and research practices are unlikely to have changed significantly in such a short period of time. The focus on communities of practice and their role in transitioning from a student into an independent scholar was pervasive through the whole population, and hence warranted a second look. And finally, the success of the two most important improvements that we made in our services to graduate students in the humanities—the building of a graduate community space in one of our libraries that brings together graduate students across disciplines (http://olinuris.library.cornell.edu/content/501) and our graduate student immersion program, soon to be offered for the third year in a row (http://staffweb.library.cornell.edu/node/3582) supports the decision we made to devote resources and staff time to a second assessment project on the same data.

Conclusions
As all three projects discussed above demonstrate, undertaking an assessment project when it is only part of your job, if that, entails multiple challenges. The time commitment is substantial—from training, through implementing the project, and analyzing the results. Further, acting upon the findings of the assessment project requires institutional commitment that often goes beyond the responsibilities of those engaged in the project. Despite the numerous challenges, assessment projects carried out by non-assessment staff offer significant benefits, as well, the most significant of which are the opportunity for staff development and the systematic first-hand knowledge of user behavior that front-line staff acquire.

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References


Exploring Assumptions in Library Assessment and their Implications on Practice

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Abstract
All of the assessment work we do has hidden assumptions embedded within. This panel session invited assessment professionals to look inward and discover and/or remind ourselves of the assumptions we often make consciously or unconsciously when designing and implementing assessment projects. Reflecting on our own practices at both large and small universities, and the larger literature in assessment, the presenters discussed the assumptions they see in the types of questions, methods, and analysis library assessment professionals utilize. Also discussed are establishing validity and practical suggestions for reducing assumptions.

Introduction
All of the assessment work we do has hidden assumptions embedded within. This session invited assessment professionals to look inward and discover and/or remind ourselves of the assumptions we often make consciously or unconsciously when designing or implementing assessment projects. In this proceeding, we first consider assumptions in the questions we ask and interpretation of results, and then turn our attention to the theory and practice of validity.

The panel was born out of discussions that took place among some members of the Return-On-Investment Task Group of the Council of Prairie and Pacific University Libraries (COPPUL) in Western Canada. The authors have a wide range of assessment experience, in both quantitative and qualitative methods, and in institutions large and small. Some of us are the sole people in our organizations who are responsible for evaluating library services and resources, while others act as a guide to many in their assessment efforts. With these viewpoints, we see many assumptions being made, both on our parts and on the part of others.

Confirmation Bias: Its Influence on the Questions We Ask and the Way We Interpret Results
Jeremy Buhler:

In 2012 UBC Library conducted a series of focus groups with first year undergraduate students several months after they had attended a library workshop that taught, among other things, some basic research skills. When compiling a report to share selected results with library staff we chose to title one of the sections “Ctrl+F.”

Only one student explicitly mentioned Ctrl+F as a search strategy, but several shared comments that suggested a similar conceptual framework for research. At the risk of oversimplifying, these
students appear to have mapped the argument of their research papers in advance after only a superficial review of information sources. To them the research process seemed primarily about finding material to fill the gaps in a pre-determined thesis. Ctrl+F became our shorthand for a selective research process that failed to engage with contradictory sources and sought to find only that which was already believed to be true.

I share this story to introduce the topic of confirmation bias, the tendency “to notice and to look for what confirms one’s beliefs, and to ignore, not look for, or undervalue the relevance of what contradicts.” In this section we will briefly explore confirmation bias and introduce the related concepts of motivated reasoning and cognitive dissonance. This is a personal account rooted in examples from the authors’ own work in academic library assessment. The examples illustrate the impact that confirmation bias can have on the questions we ask about library activities, as well as on the way we interpret results.

The Questions We Ask
Kathleen Reed:

Confirmation bias can be seen on an individual level, and within the general collective beliefs of the library profession. I had not thought much about the little-examined stories we tell ourselves as a profession before the library in which I work stopped fining our borrowers for overdue resources. When I talked to librarians outside my workplace, many seemed horrified that we were removing what they believed to be the only motivation students had to return materials. For these folks, each time a library user brings back resources before a due date is reached, a confirmation bias is reinforced.

The importance of library fines is one belief that is rarely examined within the library profession. Yet at Vancouver Island University, return rates improved after the policy change and we gained significant goodwill among our users.

The rarely questioned belief in our profession about the utility of fines led me to consider what happens when confirmation bias is taken a step further and motivated reasoning begins to occur. Motivated reasoning refers to the “unconscious tendency of individuals to process information in a manner that suits some end or goal extrinsic to the formation of accurate beliefs.” It goes beyond simply confirming one’s beliefs and extends to planning and goal-setting based on misinformation. Building policy around the belief that fines are effective at increasing return-rates is a case where motivated reasoning is occurring at a professional level.

The strength of an assessment culture at a library can also influence assessment assumptions. In a strong culture, assessment is valued and seen as a way to improve service overall. In a weak culture, people are distrustful of activities and feel as though they are being judged as individuals. This is of particular concern to front-line staff, who continuously interact with the public. In my experience, people in these positions tend to want survey results that confirm they are giving good service. Results that contradict this are pinned on disgruntled individuals, instead of people with valid concerns. There is an important balancing act between “pat on the back” results and results that can lead to improvement.

Jeremy Buhler:

Another area where confirmation bias and motivated reasoning can affect library assessment concerns questions about library value. One of the assessment librarian roles at UBC is to help colleagues in the library develop their own assessment projects. During initial consultations I ask a series of questions to help focus the project. Often the goal articulated at this stage is to demonstrate the value of a particular library activity.

The implied assumption is frequently that the service in question is valuable and we simply need to demonstrate it. This may be the case, but it is important that we collectively acknowledge the limitations inherent in working from a position that presupposes value. At the very least, this starting point may blind us to other important parts of the picture.

Deb Gilchrist’s keynote presentation at the 2014 Library Assessment Conference included a slide indicating that the role libraries perform is indispensable. I agree with this, but with a qualifier: librarians’ core values may be indispensable, but specific programs and activities are just temporary expressions of those values,
relevant in a particular place, time, and set of circumstances. The real value of librarians comes from the professional discernment that helps them translate those core values into meaningful action in a rapidly changing environment.

If you accept this, then a more productive question than “How valuable is service x?” is to ask “Is service x valuable?” It is a riskier and a scarier question, but it is also potentially much more useful and rewarding. The challenge in the context of confirmation bias and motivated reasoning is that to those closely identified with a particular service this line of questioning may seem like a personal attack. As assessment librarians one of our jobs is to establish the trust needed to support this kind of open inquiry.

And what are the consequences if we fail to do this? How does the assumption that x is valuable affect what questions we ask? Among other implications, if we ask the narrower question that presupposes value we may rely too heavily on feedback from those who already use the service, missing the chance to connect with a new audience and to identify opportunities we might otherwise have missed.

How We Interpret Results
In its 2013 LibQUAL+® survey UBC Library included a subset of optional questions in addition to the standard set. One of these asked respondents about their perception of service when it came to “library orientations and instruction sessions.”

When analyzing the quantitative LibQUAL+ results we sorted questions in two ways: first, by the mean desired service level, ranking questions to identify the highest priorities; and second, by the number of respondents who answered “not applicable” to a particular question. Questions with a large number of N/A responses were assumed either not to be relevant to the respondents, or to represent services they had not taken advantage of.

The result? Library orientations and instruction sessions had the lowest overall desired service level. The story told by the N/A responses was similar: the question about instruction had more N/A responses than all but one of the LibQUAL+ items. Notwithstanding potential ambiguity in the question (which conflates instruction and orientation) the results suggest that whatever value there may be in the instruction program, respondents’ perception of that value is not commensurate with library investment. But there is also a third way to view these results. In part because expectations were so low, the question about “library orientations and instruction sessions” was also the only survey item where UBC Library exceeded expectations. For undergraduates, graduate students, and faculty alike, the mean perceived score on this item was higher than the mean desired score.

When analysing LibQUAL+ results as a group, confirmation bias manifested as a tendency to focus on “exceeding expectations” to the exclusion of other considerations. But “exceeding expectations” is only part of the picture. Failure to grapple with the other message—about the relatively low level of expectation—could result in missed opportunities to develop new services, to market existing services more effectively, or to modify investment in an area where returns appear to be relatively low.

This LibQUAL+ example illustrates the tendency to seek interpretations that minimize cognitive dissonance; in this case, the disconnect between spending many hours teaching and the suggestion that library users do not, on the whole, value that work. Cognitive dissonance is an awkward, uncomfortable, unsustainable space for humans to inhabit, but assessment librarians have a professional responsibility to develop their tolerance for these awkward spaces. The challenge is to avoid a knee-jerk, fight-or-flight response to disconcerting data and engage with it for long enough to achieve real insight.

Kathleen Reed:

Another basic assumption that I see is that correlation equals causation. For example, I have heard happy librarians exclaim that student traffic at their reference desks has increased, which they correlate to increased promotion. However, it cannot be assumed that the increased numbers are related to promotion; perhaps a flawed web design was just introduced and students are having difficulties due to the new design. In this instance, it would be critical to dig into the types of questions being asked to help determine student motivation for asking for assistance.
Related to the example above, I have noticed a tendency for some people in the library world to simplistically believe that (aside from complaints) increasing numbers are good, and decreasing numbers are bad. This is a fundamentally flawed view of library statistics, but I believe it can be linked to fears about services disappearing. For example, at my institution’s service desks business is drying up. Physical resource checkouts have been in decline for over a decade. Staff have come to associate lower numbers with the jobs they have been doing for decades going away. Instead of seeing this as an opportunity to shift to new service models, they live in fear of even lower numbers.

Validity in Theory
Allison Sivak:

A common question that members of this panel have received from library colleagues has been, “But can you generalize from the amount of data that you’ve collected in this assessment?” We have heard this question regarding projects that involve both quantitative and qualitative data; it suggests a certain level of anxiety from colleagues as to how much evidence we require to make a decision with confidence. At worst, it can be used as a way to dismiss the assessment project altogether. What is validity, and how do we understand it in the context of quantitative and qualitative assessment data?

Cronbach and Meehl delineated the concept of quantitative validity in the 1950s into three facets: content related validity, criterion validity, and construct validity. Construct validity considers the extent to which the items being measured actually represent what the researcher wishes to measure, as opposed to Campbell’s external validity, which asks, “to what populations, settings, and variables can the observed experiment effect, be generalized?”

The question of what “validity” is within a qualitative methodological framework is much murkier, with perhaps less agreement on what constitutes reliable research from this kind of data. Guba and Lincoln, key scholars in the area of qualitative work, suggest that it is important for qualitative researchers to discuss “what we might use to make both professional and lay judgments regarding any piece of work.”

In practice, much library assessment falls into the category of mixed methods research. In this context, validity has been defined as “the accuracy with which researchers draw inductively and deductively derived conclusions from a mixed methods study, characterized by meaningful integration of quantitative and qualitative methods.”

However, as Ivankova usefully reminds us, evaluation of research quality always maintains a certain subjectivity: “Evaluation standards and the choice of strategies are often influenced by researchers’ philosophical views and epistemological practices that dictate the terminology, definitions, and interpretations of validity in quantitative and qualitative inquiry and, consequently, the assessment of the quality of the integrated meta-inferences in mixed methods research.” Tashakkori and Creswell’s use of terms such as “accuracy” appear to hold to more objective understandings of research evaluation.

In contrast, Spencer et al. present a series of validity “measures” that seem to acknowledge the subjectivity in evaluation that Ivankova emphasizes. Valid research, according to the authors, meets these criteria:

- It is contributory, or advancing a wider knowledge or understanding.
- It is defensible in its design, providing a research strategy that can address the questions which are being asked.
- It is rigorous in its conduct, demonstrating both systematic and transparent collection, analysis, and interpretation of the qualitative data.
- It is credible, “offering well-founded and plausible arguments about the significance of the data generated.”

Returning to the question of assumptions made within the field of library service assessment, perhaps a challenge to put forward to our colleagues is to be aware of our individual narratives regarding how and why library services work or do not work for our users. We might be conscious of the complexity of our institutions, services, and of the individuals we serve, and therefore be open to being surprised by assessment results, using that moment of surprise as a cue to listen more closely, rather than to reject what does not fit with our prior knowledge. Beach,
Becker, and Kennedy (quoted in Dellinger and Leech 2007), suggested that although we all come to research with ideas regarding the phenomena we are investigating, a tension is created when we are open to new ideas regarding the phenomena, checking their fit with our original ideas and then developing new knowledge.¹⁰

Librarians gain a great deal of understanding of the impact of our services and the behavior of users through professional practice, to be sure. At the same time, we must acknowledge that we each hold a partial picture. Formal data gathering and assessment activities add to our individual pictures, whether through confirmation or through dissonance, but our picture remains partial. As Mason states, “Indeed, if the social world is multidimensional, then surely our explanations need be likewise.”¹¹

Validity in Practice

Chelsea Garside:

How do we go about constructing assessment projects to maximize the validity of the data collected? Most importantly, we must pay attention to factors that may limit validity, try to avoid them if possible, and take them into account if it is impossible to mitigate them.

At the University of Victoria (UVic), we use a three-tier assessment planning tool developed to increase the validity of assessment data. The model of the tool is as follows:

• tier 1 is broad-scale, e.g., LibQUAL+ data, circulation statistics, gate counts, etc.;
• tier 2 is medium-scale, e.g., local survey results; and
• tier 3 is fine-scale, e.g., focus group data and interview data.

This tool allows the data collected at each level to be used to assess the validity of data collected at other levels and to search for themes in the data.

There are also two major ways, of many possibilities, in which validity can be limited by our assumptions. The first is through ineffective design of the sampling frame, where we may accidentally leave out a specific respondent group, for example sampling only people in the physical library, neglecting other users such as distance users, or not noting the importance of seeking the opinions of those who do not use the library regularly. At UVic, we recently ran a Student Technology Survey, and though we carefully included distance students in our survey, some questions were not applicable to off campus students. This was an excellent reminder to closely review the sampling frame and the survey together to ensure that respondents will have a seamless survey experience.

Not recognizing our natural biases, or the “lenses” through which we see the library, is another major way through which validity may be limited. When we make assumptions about our users, we may compromise the collection of true and accurate data. Often we may think “Our users are just like us!” and “they will understand exactly what we mean in our survey!” However, we may not have asked the right question, or asked it in the right way to collect the data we want to access. Testing survey instruments is vital to avoiding a survey that can only be understood through our specific lens. Even with survey testing, challenges to validity may still persist. An example of this is the question used on a recent UVic Libraries’ undergraduate survey: “On a scale of 1–10, how would you rate your access to print materials through the UVic Libraries?” The survey question was tested with staff, with student workers, and with a sample of undergraduate students. However, when the survey was deployed, many undergraduate students did not know what “print materials” were, and thought they were being asked to rate the access to printers with which to print articles.

Being aware of these pitfalls will help increase the validity of the data collected, in turn leading to an accurate understanding of library users and their needs.

How to Minimize Assumptions

Kathleen Reed:

Having highlighted a number of assumptions that appear in library assessment work, I will now wrap up this panel discussing how to best minimize assumptions. There are several strategies that librarians can use to help identify and reduce assumptions in our work, some of which have been mentioned above:

• Asking “to what end?”—Interrogating what is motivating us to ask certain questions and phrase our queries in the way that we do can help surface our biases. As Jeremy discussed
above, there is a difference between asking “how valuable is service x?” and “is service x valuable?”

- What does not fit in your analysis?—Fitting data into some kind of knowledge framework is a big part of analyzing and making sense of data. But it is also useful to step away from looking for patterns and explore what data are not fitting neatly into an analysis. How do we treat this data, and what is it telling us?
- Feedback from library users, and colleagues on and off campus—Getting multiple sets of eyes on assessment plans and instruments can expose built-in biases. Chelsea gave a great example of this above, when she mentioned that although the term “print collection” was understood by library student workers, students who did not work in the library misunderstood the phrase.
- Use social psychology—While many of us work to present our assessment findings as clearly as possible to our audiences, if we want them to think more critically, social psychology research suggests that we make the information slightly difficult to comprehend via design choices. Fluency is “the relative ease experience during [cognitive] processing and can be altered by features such as the visual clarity of text.” Researchers have found that disrupting fluency “prompts a deeper, more analytical, and critical processing of information itself.” For example, a 2011 study of high school students who received materials in Comic Sans italicized font scored higher on exams than students who received the same material in a font that promoted fluency. The authors attributed this to the increased effort required to read and process the material.

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Endnotes
12. Ivan Hernandez and Jesse Lee Preston, “Disfluency Disrupts the Confirmation Bias,”
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Assessing the Impact of a New Library on Graduate Students’ Use of Library Spaces

Bertha P. Chang
North Carolina State University, USA

Abstract
A two-part online survey was used to assess how a new library building at North Carolina State University impacted engineering and textiles graduate students’ use of library spaces. Results from the first survey, which was administered in fall 2012 two months before the opening of the Hunt Library, were compared to results taken from a follow-up survey given one year later in fall 2013. The findings show an increase in overall usage of campus libraries by this population of graduate students, suggesting the importance of library proximity to students’ classrooms and offices. Additional findings showing a tendency to favor individual or group work at different campus libraries indicates the possible influence of library space configuration and design.

Introduction and Background
North Carolina State University (NCSU) is a land-grant university and the flagship science and technology institution in the University of North Carolina system. With a student enrollment of approximately 34,000 students, NCSU is located in Raleigh, NC and consists of three campuses, the original Main Campus and two newer campuses each located one mile away: Centennial Campus and the Centennial Biomedical Campus. A library system of five campus libraries serves the university. Prior to 2013, the NCSU Libraries was made up of one main library on Main Campus (D.H. Hill Library) and four smaller branch libraries, which included the Textiles Library on Centennial Campus. On January 2, 2013 a new library building, the James B. Hunt Jr. Library, opened on Centennial Campus. At the same time, the Textiles Library was closed, keeping the overall number of libraries at five.

The Hunt Library serves as a second main library for NCSU and is meant to define the library of the 21st century. It offers a variety of technology-rich learning spaces, including dedicated commons spaces for both graduate students and faculty.

The opening of this building has met a need for a central library on Centennial Campus, a rapidly growing research campus that includes university departments and research centers alongside industrial and government partners. The Colleges of Textiles and Engineering, which are located on Centennial Campus, are the primary academic users for the Hunt Library. The College of Textiles (COT) has been located on Centennial Campus since 1991 while the College of Engineering (COE) began moving over from Main Campus in 2004. At this time, six of the ten engineering departments have completed this move, with four departments still located on Main Campus.

Over the past several years, librarians at NCSU have been engaged in a series of user studies centered on the Hunt Library. During the planning process, these studies gathered data needed to support decisions on spaces and services for the new building. Now that the Hunt Library is open and operational, the focus of these studies has shifted to post-occupancy assessment.

One of these studies was designed primarily to examine how the Hunt Library has impacted library space use by graduate students in the Colleges of Engineering and Textiles. A two-part survey approach was used, in which the first survey was administered in fall 2012 (i.e., two months before the opening of the Hunt Library), while the second survey was conducted one year later in fall 2013, after the library had been in operation for about ten months. The idea for this approach came from longitudinal surveys that have been used by other academic libraries such as the University of Washington, but the focus here was primarily on taking “before” and “after” snapshots of library use by these graduate students.

Methodology
The research questions addressed by the surveys focused primarily on use of study spaces: how and
to what extent were students using physical spaces in the campus libraries; if students were using library spaces for individual or group work; and for the pre-Hunt survey, if students anticipated using the new library. In addition, the surveys were used to further explore matters previously raised in interviews and focus groups, namely, other study spaces used by the students, the types of technologies they used for studying, and their awareness of basic library services.

Both surveys were designed in and administered using Qualtrics, an online survey software tool. The questions and overall format for the two surveys were kept the same as much as possible in order to allow for comparison of responses. Both surveys consisted of several “blocks,” or sets of questions: demographics, use of campus libraries (for that particular semester only), use of library services, other work/study spaces available to the respondent, and use of campus and personal technology. In addition, the 2012 survey asked students a series of questions about their anticipated use of the Hunt Library. The total numbers of questions in the two surveys were 96 and 78, respectively. However, most respondents did not encounter every question due to branching. For example, students who were not living in the Raleigh geographic area during the semester in which the survey was administered (e.g., away on an internship) were not shown questions on library spaces while students who indicated they had used campus libraries were directed to specific questions about those libraries. In addition, free text questions allowed students to describe in their own words what they liked the most and least about the libraries.

Survey questions were drafted and first reviewed with other NCSU engineering librarians before being reviewed by the survey consultation service provided by NCSU’s University Planning and Analysis (UPA) Office (now the Office of Institutional Research and Planning). Pilot testing was then carried out with graduate student library workers; their feedback was used to improve question clarity and to check that the surveys could be completed in approximately 20–25 minutes. Institutional review board (IRB) approval was obtained for both surveys prior to their administration.

Since the questions on library space use asked students to respond only on their experiences for that given semester, the surveys were not administered until weeks 11 and 12 in order to allow students sufficient time and opportunity to have used library spaces. The UPA Office provided contact information used to send all registered on-campus graduate students in the Colleges of Engineering and Textiles an e-mail invitation to participate in the survey. All survey responses were anonymized. Students who completed the survey were given the chance to enter a drawing for one of five Amazon Kindles. Analysis of the survey results was carried out using data analysis tools available in Qualtrics and with Microsoft Excel.

Results and Discussion
Invitations were sent to 2,519 and 2,611 students in fall 2012 and fall 2013, respectively. The respective numbers of responses received were 781 and 704, corresponding to response rates of 31% and 27%. Comparison of the demographics of the respondents to the actual population found proportional response rates in terms of degree program (i.e., master’s vs. PhD students), international students, and between the two colleges, including down to the individual department levels.

Library space usage
When asked, “Have you used any physical spaces in any of the NCSU Libraries at any time since the start of the fall semester?” the percentage of respondents answering “yes” increased from 77% in 2012 to 90% in 2013 (see Table I). This was consistent with projected library use based on 2012 responses to questions about anticipated use of the Hunt Library. As shown in Table II, library use was concentrated at the D.H. Hill and Textiles libraries in 2012 and at the D.H. Hill and Hunt libraries in 2013. Responses to questions on how often students used the libraries found that the overall frequency of use increased from 2012 to 2013, in which the percentage of students using library spaces more than once a week rose from 41% to 58% (see Figure 1).
Table I. Respondents’ use of campus library spaces in 2012 and 2013

<table>
<thead>
<tr>
<th></th>
<th>Fall 2012 (n=714)</th>
<th>Fall 2013 (n=646)</th>
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</thead>
<tbody>
<tr>
<td>Yes</td>
<td>77.3%</td>
<td>90.2%</td>
</tr>
<tr>
<td>No</td>
<td>22.7%</td>
<td>9.8%</td>
</tr>
</tbody>
</table>

Table II. Campus libraries used by respondents in 2012 and 2013

<table>
<thead>
<tr>
<th>Library</th>
<th>Fall 2012 (n=552)</th>
<th>Fall 2013 (n=583)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.H. Hill Library (Main Campus)</td>
<td>94.7%</td>
<td>54.2%</td>
</tr>
<tr>
<td>Textiles (Centennial Campus)</td>
<td>46.4%</td>
<td>---</td>
</tr>
<tr>
<td>Hunt Library (Centennial Campus)</td>
<td>---</td>
<td>95.0%</td>
</tr>
<tr>
<td>Design Library</td>
<td>1.4%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Natural Resources Library</td>
<td>1.3%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Veterinary Medicine Library</td>
<td>0.9%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Other</td>
<td>0.4%</td>
<td>---</td>
</tr>
</tbody>
</table>

Figure 1. Respondents’ frequency of use of D.H. Hill, Textiles, and Hunt libraries in 2012 and 2013 (where frequent use is 2–7 days/week; moderate use is 2–4 days/month, and light use is once a month or less).

To better understand the factors that may have contributed to this increased usage, free text comments provided by 2012 library non-users were first examined. Analysis found two frequently mentioned reasons for not using library spaces (not including comments that simply stated “no need”). One was the inconvenience associated with traveling to a campus library, which included issues related to distance, transportation, parking, and traveling time. This was especially true for Centennial Campus-based students with respect to using the D.H. Hill Library on Main Campus. Interestingly, very few of these students mentioned using the Textiles Library, possibly because of its limited size and/or operating hours. The other frequently given reason was the availability of alternative workspaces, particularly campus-based offices. However, campus office space is generally available only to students conducting research under a faculty advisor. At NCSU, a large number of engineering students are enrolled in non-thesis master’s degree programs in which they are only taking classes and are not required to conduct research. Thus, availability of office space is heavily skewed towards PhD students. Survey data found that over 90% of PhD respondents had offices compared to 12% of non-thesis master’s students. Hence it was not surprising to find that two-thirds of the 2012 library non-users were PhD students.
even though PhD students made up 48% of the COE and COT graduate student population.

Responses between 2012 and 2013 respondents were then compared for different subgroups of users based on their department’s campus location and their degree programs. Table III shows an increase in the percentage of library users from Centennial Campus-based departments, from 75% in 2012 to 92% in 2013, while usage from Main Campus-based students remained fairly constant.

In looking at library space usage as a function of degree programs, an increase was seen in 2013 across all degree programs, with the biggest jump occurring among PhD students from 67% to 84% (see Table III). These two results suggest that with the opening of the Hunt Library, one of the main impediments to using library spaces—namely geographical location (or ease of access)—has been removed, with the consequence that even students who have campus offices are now coming into the libraries.

Table III. Comparison of respondents’ library usage by departmental campus location and degree program for 2012 and 2013

<table>
<thead>
<tr>
<th>Departmental campus location</th>
<th>Fall 2012</th>
<th>Fall 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centennial Campus</td>
<td>75.4%</td>
<td>92.2%</td>
</tr>
<tr>
<td>Main Campus</td>
<td>85.4%</td>
<td>82.3%</td>
</tr>
<tr>
<td>Degree program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master’s (non-thesis)</td>
<td>86.3%</td>
<td>97.2%</td>
</tr>
<tr>
<td>Master’s (with thesis)</td>
<td>85.7%</td>
<td>90.6%</td>
</tr>
<tr>
<td>PhD</td>
<td>66.6%</td>
<td>84.0%</td>
</tr>
</tbody>
</table>

**Individual versus group work**

Another series of questions in both surveys focused on gaining more visibility into the type of work these students were engaged in while working in library spaces. For each campus library that respondents identified using, they were then asked if they worked by themselves on classwork, worked by themselves on research, studied with classmates for tests and homework, worked with classmates on group projects, and/or went to the library with friends. The first two activities were classified as “solo” work while the last three were classified as “group” work. Figure 2(a) shows that in fall 2012, while roughly one-half of the users at the D.H. Hill Library worked both on their own and with others, a significant number (42%) only did solo work. However in 2013, these activities became more location-dependent. Activities at the D.H. Hill Library tended more towards solo work while a greater degree of group work took place at the Hunt Library (see Figure 2(b)).
Figure 2. Distribution of individual versus group work for (a) D.H. Hill Library in fall 2012 and (b) D.H. Hill and Hunt libraries in fall 2013

This bifurcation in activity may be a result of the types of spaces available at the two libraries. The Hunt Library was designed with collaborative work in mind and has a far greater number of group study rooms and collaborative spaces than D.H. Hill. On the other hand, while traditional one-person study carrels are available at the D.H. Hill Library, solo study space in the Hunt Library is provided mainly in the form of quiet reading rooms consisting of large reading tables.

In hindsight, this divergence is not altogether surprising, and hints at a possible need for more quiet and/or individual spaces in the Hunt Library. This is consistent with findings from a spring 2013 observational study of the Hunt Library Graduate Student Commons. For group study rooms located in the Graduate Student Commons, it was found that single students occupied rooms 27% of the time. Similarly, in 26% of the instances where computer workstations were occupied, students were not making use of the computers themselves, but simply using the workstation spaces to study. It is possible that this is because the configuration of these workstation spaces is the closest approximation to traditional study carrels that students can find in the Hunt Library.

Conclusions
The opening of a new library building at NCSU provided a unique opportunity to study the impact of these new study spaces on graduate students in the Colleges of Engineering and Textiles. Analysis is still ongoing, but initial results from a two part before-and-after survey show that more of these students are now using library spaces and using them more frequently. In addition, even students with campus-based offices are utilizing library spaces in greater numbers. One likely reason for this increased usage is the close proximity of the Hunt Library to engineering departments on Centennial Campus. Results from the surveys...
also suggest that the configuration and furniture in campus libraries may be influencing the type of work students are doing, i.e., individual versus group work. This warrants further investigation to determine if there is a need to supplement the Hunt Library’s current design with additional individual and/or quiet spaces.

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Acknowledgements
The author thanks Honora Eskridge for helpful discussions and Dr. Nancy Whelchel from the University Planning and Analysis Office for her suggestions in designing the surveys.

Notes


Sustaining an Assessment Mentality to Navigate Library Space Planning

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Abstract
In 2008 the university libraries at the University of North Carolina at Greensboro conducted a series of assessment activities for the purpose of providing an outside space consultant the feedback needed to influence the programming and design of renovating space for an almost 60-year-old academic library. The resulting study produced by the consultant gave an excellent foundation for upgrading the existing facility for repurposing space and addressing contemporary user needs. Financial shortfalls and building restrictions thwarted the work from this design, but the assessment activity developed at the time provided a model for continuous assessment of space in smaller projects designed to plan changes to space when possible. This paper provides examples of those assessment activities and the outcomes produced as a result.

Introduction
The purposeful assessment of space with the goal of repurposing library space for changing users’ needs began in 2008 with a series of assessment activities designed to learn what students, faculty, staff and the community needed in a new era of electronic resources and shared information environments. This data was produced to inform an outside consultant completing a multiphase plan of renovation for guiding future renovation activities. The result was an elaborate space study product meant to provide the library a blueprint of renovation to be executed in phases over the next five years. This project was documented in the LAC 2008 proceedings article by the same authors.

Unfortunately, execution did not happen due to the economic downturn along with infrastructure and code issues with the building. The libraries have been forced to downsize renovation projects into smaller events that include partners and other means of support for accomplishment. With each of these smaller endeavors, however, assessment activities were conducted in order to provide evidence justifying the investment into the needed changes. This reinforced to libraries’ staff and partners that assessment is always a critical component to any project.

Why is Assessment Important?
The changes to the libraries’ space needs have been significant. In the 1990s stack space was expanded at the cost of reduction in seating. Gate counts declined as students only seemed to utilize the libraries when they needed materials or instruction on resources. But the Internet and electronic age changed how students obtained their resources, how they studied, and how they used the libraries. It was important to assess these changes to better serve the university community and its changing needs. Assessment needed to be purposeful and align with the university and libraries’ missions with the gathering of evidence and demonstrating that the libraries were partners in learning. And as part of the organizational culture for libraries’ staff, it was important for assessment activities to have a purpose with proven methods for data collection and strategies for reporting and implementing actions based on the results.

What Did We Learn from Assessment?
The original assessment referred to in 2008 produced significant insights into the changes taking place in the use of an academic library. The evidence gathered in 2008 used a variety of assessment methods in combination: surveys, focus groups, design feedback, interviews, and observation studies. We learned that students do value workspace over materials and that this workspace needed to be flexible for different types of use. The impact on the libraries’ culture was dynamic as this began to change the libraries’ views on content format, furniture attributes and support services. This knowledge produced a lot of “what ifs” that gave intent for future projects. For the record, the first phase of the project from this assessment was a repurposing of space to...
expand Special Collections and University Archives (SCUA). Evidence from the study indicated the areas could not function as needed in the space they were occupying at the time.

This shift in space produced the need for the next project concerning space for researchers coming to SCUA. Previously, internal and external researchers were asked to work in a multipurpose reading room that was also exposed to public traffic. With space for the collections and staff now updated, work conditions were better and it was felt that the quality of research could be improved by enhancing the research area. Previous researchers were interviewed and surveyed to determine what space attributes impact the quality of their research. The results produced good evidence that a dedicated space was needed and an adjoining room to the reading room was remodeled to accommodate this activity.

In looking for partners to address improvements to our space use, we collaborated with a senior-level interior architecture class. One of the professor’s specialties was learning spaces, so it was a perfect fit! We made arrangements for his classes to review and assess the Harold Schiffmann Music Library and a portion of Jackson (main) Library. Students were put into teams to analyze and recommend changes to these spaces. The primary assessment tool was observing and interviewing other students and users of the space and of course, as students, they had their own perceptions. These were programming interviews to determine how visitors to these spaces could best use them and what changes would make them more efficient. It was learned that the Music Library was in desperate need of open, flexible, and comfortable space as well as inspiring color. The exercise prompted a furniture redesign to remove dated and heavy music carrels, which housed equipment no longer in demand and replaced it with table, chairs, and comfortable seating that encourage collaborative interaction. The walls were also painted non-traditional colors for an enhanced visual effect.

It should be noted that these student presentations were presented to a broad audience of libraries’ staff and interested patrons to share ideas and visions. They also maintained blogs which included their design ideas. Jackson Library was given attention and we did replace some furniture, but changes were limited due to budget restrictions. This student perspective was a great way to see space through their eyes and should be repeated in the future.

As these projects are being described in chronological order, please note that during this time the libraries conducted LibQUAL+® (2012). We previously conducted LibQUAL+ in 2008. Related to the Library as a Place category, we learned that although the trend is for group work and collaborative activity, there still exists a need for quiet space for individual reflection. We also learned that students expect a correlation between physical space and virtual space, in terms of the website primarily, so this information was shared for proposed changes and follow-up.

The next area of consideration for space improvement became the main library’s lower level of basement, which housed approximately 9% percent of the print collection. As a massive
Weeding project begins to make room for renovation possibilities, it was decided to assess the need for digital media support on campus to determine if there was a need and how we might repurpose the lower level to support it. Assessment was informal at first through conversation with instructors and teaching support departments. In 2010 we conducted a student survey to gain input on their media literacy needs.

We learned that having an open lab where students could access both the technology and the expertise for multimedia was a critical need on campus. Previously only media studies majors had access to these services. Partners for this project became the Media Studies Department and Undergraduate Studies who assisted with both advice and funding to get the space functional. The Commons opened in 2012 and is very successful. The Digital Media Commons is also a phased project so assessment has been ongoing in terms of tracking needs, features used, tools, and programs, so as to invest accordingly in the future.

During the assessment and consideration of building a Digital Media Commons, it was announced that the Campus Master Plan had been updated to include a more current frame of reference based on financial considerations, enrollment growth, and community needs and trends. This plan became a significant piece of information for the libraries that, until this point, had been expecting an expansion or possible addition that had been included in previous master plans. Recognizing that a future building replacement or expansion was not to be had was disappointing but relevant to future space considerations. With this new information, the libraries must address and adapt its space needs, in the future, with existing building facilities.

With the new Campus Master Plan in mind, the most recent assessment project was conducted in 2014 to determine any changes to building use since the 2008 overall space study. With limited budgets the assessment focused on choices that were financially possible and lower ticketed items, such as wipe boards or specific products needed for tech lending. The assessment was conducted with surveys, observation studies, and focus groups and was designed to gather information on things that were affordable. It also served as a follow-up to the LibQUAL+ results regarding the physical/virtual and quiet space issues.

This Wordle was produced from comments made in the survey asking, “How do you use the Library?” We were gratified to see answers that supported completed or ongoing projects.

This latest assessment project further informed or reinforced the challenges faced going forward for enhancement to furniture, equipment, and tools/supplies needed by students, as well as the continued desire for designated quiet space and the enlarging of the Digital Media Commons. This data will be used in the next couple of years for strategic planning on making space improvements.

These projects are all summarized in this table:
<table>
<thead>
<tr>
<th>Project</th>
<th>Assessment Methods Used</th>
<th>Summarized Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Space Assessment</td>
<td>Survey, observation, focus groups, interviews, design feedback</td>
<td>Students value space over materials, need flexible furniture and multiple venues</td>
</tr>
<tr>
<td>Researcher’s Space</td>
<td>Survey, interviews, review of statistics</td>
<td>Research activity has reached a point of need for dedicated space and support environment</td>
</tr>
<tr>
<td>Interior Architecture Students</td>
<td>Programming interviews, scenario designs based on contemporary design principles</td>
<td>Refresh of the Music Library with furniture updates, festive paint and space for comfort seating</td>
</tr>
<tr>
<td>LibQUAL+</td>
<td>Survey, follow-up focus groups</td>
<td>Need a merge between physical and virtual spaces, i.e., website and clarity between group and quiet study spaces</td>
</tr>
<tr>
<td>Digital Media Commons</td>
<td>Interviews, surveys, usage stats to determine areas needed for growth</td>
<td>Many curriculums had an expectation of media inclusion in student’s work and an open facility was not available</td>
</tr>
<tr>
<td>Campus Master Plan Update</td>
<td>Redesign by architects to update campus growth needs with realistic expectations</td>
<td>Changed long term view of library’s addition or expand to solidify need for continued renovation projects</td>
</tr>
<tr>
<td>Update to Building Use and Needs</td>
<td>Survey, observation, focus groups, usage stats</td>
<td>With continued budget declines, needed a focus on where to spend monies for greater need</td>
</tr>
</tbody>
</table>

**Culture of Assessment**

In a time of declining resources the libraries have found value in assessing needs and expectations before embarking on the use of monies and resources. Libraries’ staff has come to expect assessment activity before decisions are made with regard to space or a financial investment into related uses. Evidence produced by assessment can justify many actions but ongoing assessment can demonstrate improvement and effectiveness within the organization as a whole. An assessment LibGuide ([http://uncg.libguides.com/libassessment](http://uncg.libguides.com/libassessment)) is maintained that includes the assessment plan for each year along with results, reports, and presentations on all assessment projects.

Cultural Assessment as defined by Lakos, 2002, Conference Proceedings on Performance Measurement, “An organizational environment in which decisions are based on facts, research and analysis, where services are planned and
delivered in ways that maximize positive outcomes and impacts for customers and stakeholders.” —Copyright 2015 Michael A. Crumpton and Kathryn M. Crowe
Purpose
Many academic libraries are part of a growing trend of having a unified service desk, where users visit a single desk to get help from the library and other campus services. Although unified service desks offer the convenience of one-stop assistance, the various units may still act as silos, with each unit assuming responsibility for only that particular service. The University of Dayton’s Roesch Library, however, is exploring a different model. It is piloting a service that lends itself to true integration with external departments. Service integration facilitates better cross-training and less confusion for students who may need multiple forms of help in one common area.

The library began considering possible service integration with the campus writing center after observing several common trends: growing study space needs, difficulty in finding the writing center, and a growth of in-depth consultations at both service points. Data sources—notably LibQUAL+® survey data, service desk statistics, and floor counts—were used to discern these trends. By combining two separate service areas, the library could deliver one-stop assistance for research and writing needs as well as freeing up previously underutilized study space.

Prior to seeking a combined integrated service area, the writing center was located in a separate location on the library’s second floor. However, the library’s biggest service areas, circulation and reference, are on the first floor. They are also the main desks where students seek help. Thus, the areas were separated by a floor and there was no good mechanism for effective referrals. Moreover, the library had an agreement with the writing center that the writing center area would revert to an open study space after they closed. After analyzing floor count data, it was clear that the area was not being used to its full potential and the furniture layout conveyed a sense of a restricted work area.

In addition to the writing center’s somewhat remote location, its organizational structure was administratively external to the library. As an outside department residing in the library, both the writing center and the library needed to learn and recognize the different organizational cultures. For example, during this integration we realized that department identity resonated very highly for the writing center. Culturally, a department that the library considered a guest within the library walls was now being asked to relocate and give up a space that was an important part of its identity.

Design/Methodology/Approach
A thorough process analysis of services was needed to better understand the mechanics and workflow of the campus writing center. The library had some insight into the writing center’s activities, namely in space use and in answering queries about the writing center. Both writing center floor counts and queries about the writing center are recorded using Desk Tracker software. While traffic and reference desk questions had been well documented, gathering and reviewing data from another department was a new venture. We were fortunate to be able to collaborate with the writing center to transcribe and analyze a semester’s worth of writing consultant reports, which are recorded on a paper form after each writing session. These reports contained a wealth of information, not only about the writing center clients, but also about the contents of the sessions.

In addition to analyzing data from library and writing center sources, the managers of both units meet in person on a regular basis to share insight about the administration of the respective areas. Together, with the meetings and data, we in the library have developed a clearer picture about the writing center functions and role in student learning. The writing center, in turn, now has a greater understanding of the activities within our reference area.
The writing consultant report data indicated that students sought help at various stages in the writing process. The analysis revealed opportunities for reference librarians to play a stronger role in helping students locate and evaluate sources that would support their writing as well as providing citation help. The reports revealed a pattern common to many students, who move from topic development to searching for sources and then to writing. The integration of the research and writing services has the potential to help students understand the iterative nature of scholarship, rather than approaching it as a linear process.

Potential Findings
An integrated service pilot will begin in the fall of 2014. This pilot involves two spaces in the renovated reference area: first, a service desk staffed by two paraprofessionals and student employees, as well as writing center student receptionists; and second, a consulting space occupied by writing center consultants and reference librarians. In the consulting space, librarians will use laptops or tablets to conduct research sessions, thus making them mobile and allowing them to partner with writing sessions as needed.

Both areas will require different collaboration approaches. Both library and writing center employees will be trained to address technology and directional needs, along with basic reference questions. Furthermore, everyone will be expected to handle the initial paperwork associated with a writing consultation. This cross-training, which will be primarily for undergraduate students, will require a more rigorous approach. We are working with the writing center to organize several collaborative training sessions, which will take place prior to the start of school and on a weekend after school begins. In addition to face-to-face training, we are currently developing an online training module within the university’s learning management system, Isidore, built on the Sakai platform. The training is largely based on an analysis of our library chat transcripts, which are recorded with our library H3lp subscription. This analysis revealed that students needed more training on the reference interview as well as a better understanding of the functionality of some of our library resources. A separate analysis of the reference transaction data recorded in Desk Tracker revealed an inconsistent application of the READ scale for categorizing reference question difficulty, which the tutorial will likewise address. This online module will make use of closed- and open-ended questions, so that we can evaluate responses and address inconsistencies with individuals as needed. The service desk will require a much stronger integration component so that we can be sure all employees meet (and exceed!) minimum service standards. The aim of our service training is that the majority of basic questions can be answered by anyone behind the desk, regardless of what department they are working for.

An analysis of the writing consultation reports indicated the need for a different type of collaboration within the new consultation area. Reference librarians and writing consultants will not be expected to assume the same degree of cross-training that is needed at the service desk. Rather, a clearer understanding of the work performed by each unit will be the underlying goal for training. The writing consultant reports created a precise picture of the writing center users, the courses in which they sought help, how long the consultations ran, and what types of help the writing center users needed. These reports were instrumental in understanding the writing center’s role in student learning, particularly in overcoming the traditional stereotype of the writing center as focused primarily on correcting grammar mistakes. The reports also revealed how the work of the library and the writing center intersects, especially in regards to integrating and citing sources in a paper. Understanding the role and work of the writing center process will mean that training for reference librarians will focus on identifying opportunities to make referrals during the reference consultation to seek writing support. Library training for the student writing consultants will aim to help the consultants identify weak sources and make similar cross-referrals to the reference librarians. The two units will continue to collect data using their respective data-gathering methods, but we will be adjusting the reports to measure for the number of cross-referrals.

The writing consultant report analysis uncovered other data patterns that could have implications when the two units begin working more closely together. For example, a disproportionate number of international students sought help at the writing center for their work. The student writing consultants go through some intercultural training,
which would likewise be of benefit to the library student employees. The data also showed that many of the students were requesting writing help for humanities-based courses. Reference librarians would do well to become familiar with those course requirements, not only to better understand the course outcomes, but also to prepare working more closely with the writing center consultants in these areas. One possible future action is to make an across-the-board effort to obtain syllabi or assignments at the beginning of each semester and share across a common platform.

Meetings with the writing center administration and student writing consultants provided insight into their work culture and their identity. Although the writing center was somewhat hidden, the location also afforded them a good degree of independence and control over their environment. It is clear that the student writing consultants value their independence and have expressed concern about sharing a more flexible work environment with full-time library faculty. The librarians, on the other hand, are experts in the research process and find value in their ability to connect users with valuable resources. They have expressed concern that the student writing consultants, who are used to working in a separate space, are largely unaware of the librarians’ specialized research skills and the need to refer questions to the librarians. For a successful collaboration, both units must be sensitive to the work culture and values of each other.

The writing center report data also highlights underutilized services by certain groups. For example, international students are a high use group of the writing center, but at the same time, they do not seek library research help at the same rate. The opposite seems to be the case with our domestic students: they often make use of our research consultation services, but we believe that they use the writing center at a lesser rate. Given the close proximity of reference librarians and writing center consultants, we hope the number of referrals will increase.

Conclusion and Practical Implications
This project utilized multiple data sources to get a robust picture of the operations of the writing center, library information desks, and the library-staffed research help service prior to a proposed integration of service points. The results highlighted known problems, such as the need for more study space and walk-in users’ difficulties finding the writing center. The analysis also uncovered problems that were less well understood, such as the need for additional library student employee training. Data sources were also used to understand the respective workflows of the writing center consultants and the research area. As this project moves into the implementation phase, the library and the writing center will work together to identify the elements of what a successful collaboration looks like. The initial, and perhaps immediate, success for the writing center will be in its location and the ease of locating their services. For the library, it will also increase study space on the second floor that was formerly occupied by the writing center.

Data will also be monitored to see if there are any success indicators. We have already noted that the number of users and cross-referrals will be important in evaluating the integrated service. Success at the new service desk will depend on well-trained students, so we will be reviewing the tutorial assessments closely. A memorandum of understanding is also being drafted so that there are clear expectations of student worker behaviors and the work they are involved in. Social media channels could also supply data for evaluating success, and we will continue to evaluate floor counts in the area after the combined writing and research service closes down in the evening.

Collaborating with another campus unit is an exciting opportunity. Integration of services, especially with external departments, is not a short or easy process. Fostering relationships where data can be shared, analyzed, and utilized between departments is always ongoing. External departments need to feel a vested stake in such partnerships. In our case, it was the promotion of their services in a more central location, while at the same time it helps address some of our space issues. This project establishes a new model where libraries can take the lead in adopting new services by inviting departments into the library for service integration.

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Data Management—It’s for Libraries Too!

Annette Bailey, Tracy Gilmore, Monena Hall, Andi Ogier, and Connie Stovall
Virginia Tech, USA

Introduction
As many academic libraries work to develop data services units to address the data needs of campus stakeholders, one early, natural avenue for testing these services lies within the library itself. During the summer of 2013, a small team of librarians endeavored to test a data audit methodology on internal library data in order to determine both the viability of the methodology as an assessment tool and as a way to audit workflows for internal data processing, naming, documenting, and storage. This team included the assistant director for collections, the collections assessment librarian, the learning commons and assessment librarian, the data science and informatics librarian, and the assistant director for electronic resources and emerging technology services. The assembled team is called the Assessment Working Group, with a stated mission to gain a better understanding of available library data and its usefulness across departments.

This paper will describe how one methodology from the field of data management, the Data Asset Framework Methodology, can be applied to library data.

Need
At the Virginia Tech University Libraries, data is collected regarding every task completed, every action taken, every link clicked, and every dollar spent. This data informs many key decisions about how the organization manages resources and provides the best possible services to our patrons. The need to better manage this data was becoming increasingly clear, and through informal conversations, the need to solve several emerging problems regarding the scalability of managing the libraries' data in the future was becoming apparent. Though this data is regarded as invaluable, rigorous application of data management policies were not in place. What data the library had, how much, and where it was stored were questions that could not be easily answered. New metrics continued to emerge and an informal group formed as concerns grew that the library needed better processes in place to ensure the availability and security of data. In 2012 the director of assessment and a team of library staff conducted an environmental scan of library data being collected. This document provided a valuable foundation for deciding what first steps to take in managing the libraries’ data. The group also requested ongoing consultation from the data science and informatics librarian to support this effort.

Methodology
The Data Asset Framework (DAF) Methodology developed by the Humanities Advanced Technology and Information Institute (HATII) at the University of Glasgow was recommended by the data science and informatics librarian at VT University Libraries. The group used the DAF to establish a business case and an interview protocol to determine the types of data held, who managed the data, and its importance to the organization. The team at VT (which later formed into the Assessment Working Group) interviewed the director of collections and technical services and the assistant director of collections to create a robust list of data assets, according to a modified version of the DAF guidelines, from those departments. The changes to the interview instrument included a list of “Questions Currently Asked” and “Questions to Add” (see Table 1). The questions were supplemented with a description of the question and whether the question was mandatory or optional.
# Table 1

<table>
<thead>
<tr>
<th>Questions Currently Asked</th>
<th>Description of question</th>
<th>Mandatory/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Report Number</td>
<td>Identifier</td>
<td>M</td>
</tr>
<tr>
<td>Report Title</td>
<td>Unique Identifier</td>
<td>M</td>
</tr>
<tr>
<td>Department</td>
<td>Library department responsible for the intellectual content of the data asset</td>
<td>M</td>
</tr>
<tr>
<td>Description</td>
<td>A description of the information contained in the data asset</td>
<td>M</td>
</tr>
<tr>
<td>Who Collects?</td>
<td>Library employee responsible for compiling the data asset</td>
<td>M</td>
</tr>
<tr>
<td>System used to collect data</td>
<td>Call this Source—where does data originate, how is it collected?</td>
<td>M</td>
</tr>
<tr>
<td>Frequency</td>
<td>Frequency of updates to this dataset to indicate currency</td>
<td>M</td>
</tr>
<tr>
<td>Start Date</td>
<td>Date when the data asset was created started mm/dd/yyyy</td>
<td>M</td>
</tr>
<tr>
<td>End Date</td>
<td>Date when the reporting cycle ends mm/dd/yyyy</td>
<td>M</td>
</tr>
<tr>
<td>Purpose (how is it used?)</td>
<td>Description of the main reason for the data asset’s creation</td>
<td>M</td>
</tr>
<tr>
<td>Caveats</td>
<td>Exceptions to rules currently in place</td>
<td>O</td>
</tr>
<tr>
<td>Reported To</td>
<td>Person who receives the report</td>
<td>M</td>
</tr>
<tr>
<td>Where is it stored?</td>
<td>Path or web address where the data asset can be found</td>
<td>M</td>
</tr>
<tr>
<td>Comments</td>
<td>Additional information relevant to the data asset</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Questions to Ask</th>
<th>Description of question</th>
<th>Mandatory/Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of files</td>
<td>Size of the data set in MB/GB</td>
<td>O</td>
</tr>
<tr>
<td>Expected growth of file sizes</td>
<td>Expected rate of growth</td>
<td>O</td>
</tr>
<tr>
<td>Difficulty in replacing data</td>
<td>Approximate—high, medium, low</td>
<td>M</td>
</tr>
<tr>
<td>Time invested to collect and process data</td>
<td>Approximate number of hours needs to complete report</td>
<td>O</td>
</tr>
<tr>
<td>Process for processing and organizing data</td>
<td>Approximate steps needed to complete report</td>
<td>M</td>
</tr>
<tr>
<td>Source</td>
<td>Where does data originate?</td>
<td>M</td>
</tr>
<tr>
<td>Naming convention used</td>
<td>FileName.extension</td>
<td>M</td>
</tr>
<tr>
<td>Date last modified</td>
<td>mm/dd/yyyy</td>
<td>M needs to be automatic</td>
</tr>
<tr>
<td>Original purpose</td>
<td>Description of what was the main reason for the data asset’s creation</td>
<td>M</td>
</tr>
<tr>
<td>Curation to date</td>
<td>History of preservation and curation activities</td>
<td>O</td>
</tr>
</tbody>
</table>
Table 1—Questions from DAF
There were two interviews conducted with the interview ID “COLTS-ER1,” named for the department and data area being audited: COLlections and Technical Services—Electronic Resources. In Audit Form 2, each data asset was assigned a unique identifier COLTS-XX, a data asset type, and a description. The manager of each asset was listed, occasionally being the person who was interviewed, but more frequently not. The source of the data was recorded and this question of provenance is important for data around electronic resources. It includes the systems that we use to manage our electronic resources, as well as external providers of data. The location of where data was stored and a classification of whether the data was “vital,” “important,” or “minor” was assigned. This was an extremely useful classification to use when discussing with the director of IT about data needs going forward and is mentioned below.

Table 2
Table 2—Column Titles from Audit Form 2
A space for “General Comments” was used to record comments from the interviewees regarding the data that did not fit into the other categories. General comments included observations indicating that certain types of data “will become more important” and other data, such as journal citation reports that “we haven’t downloaded in a while.” The Collections and Technical Services management can use these reflections to prioritize use of resources in strategic planning for the near future. Some data collection is a result of newer systems such as data from the discovery layer, both data from the discovery layer’s usage reports and harvesting of raw live “click data.” The live “click data” has not yet been used for collections analysis, but it is seen as a potentially valuable source of data for understanding collections usage. The final column in the interview report is an indication of whether the data is “raw” or is “derived.” We classify title lists from vendors as “raw” and cost per use reports generated in-house as “derived.”

Audit Form 3B was completed after the interviews were completed, given the depth of knowledge needed to answer the questions. For each unique identifier from Audit Form 2, COLTS-XX, a list of detailed data was compiled. We have included our Audit Form 3B (see Table 2). Note the level of detail needed in understanding every data asset. Once again, this instrument was invaluable in talking with key stakeholders outside of the project about technological and other resource needs regarding the library’s data. From these interviews, AWG considered long-term storage and archival needs of institutional data resources.

Once the interviews were conducted, the metadata recorded, and the document discussed by AWG, the next step taken was to invite the director of collections and technical services to review the group’s findings. This has led to the restructuring of directories and files on library shared server space. It also led to a conversation with the director of IT regarding the IT data storage needs of the Collections and Technical Services Department. This conversation was fruitful because of the findings from application of the DAF.
Table 3

<table>
<thead>
<tr>
<th><strong>Unique Identifier</strong></th>
<th><strong>From Audit Form 2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Official name of the data asset</td>
</tr>
<tr>
<td>Variant Title</td>
<td>Alternative or commonly used name, if available</td>
</tr>
<tr>
<td>Structural Type</td>
<td>Structural type of the data asset (e.g., database, photo collection, text corpus, tabular)</td>
</tr>
<tr>
<td>Content Type</td>
<td>Contents of the data asset (e.g., numerical, text, mixed, photos, code, etc.)</td>
</tr>
<tr>
<td>Owner</td>
<td>Formal owner of the data asset in terms of intellectual rights</td>
</tr>
<tr>
<td>Rights</td>
<td>Indication of the user’s rights to view, copy, redistribute or republish all or part of the information in the data asset</td>
</tr>
<tr>
<td>Usage Constraints</td>
<td>Access restrictions applied to the data asset</td>
</tr>
<tr>
<td>Source/Creator</td>
<td>Source of the data asset—may be a third party vendor</td>
</tr>
<tr>
<td>Asset Manager</td>
<td>Name of the person responsible for the current management of the asset</td>
</tr>
<tr>
<td>Original Purpose</td>
<td>Description of the main reason for the data asset’s creation</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the information contained in the data asset</td>
</tr>
<tr>
<td>Creation Date</td>
<td>Date in which the data asset was first created or received (mmddyy)</td>
</tr>
<tr>
<td>Cycle Start Date</td>
<td>Date when the reporting cycle begins (mmddyy)</td>
</tr>
<tr>
<td>Cycle End Date</td>
<td>Date when the reporting cycle ends (mmddyy)</td>
</tr>
<tr>
<td>Updating Frequency</td>
<td>Frequency of updates to the data asset</td>
</tr>
<tr>
<td>Completion Date</td>
<td>Data when the data asset was/will be completed</td>
</tr>
<tr>
<td>Date Last Modified</td>
<td>Latest date of data asset modification</td>
</tr>
<tr>
<td>Management History</td>
<td>History of maintenance of the data asset</td>
</tr>
<tr>
<td>Curation History</td>
<td>History of preservation and curation activities</td>
</tr>
<tr>
<td>Former Asset Managers</td>
<td>Chain of custody for the data asset</td>
</tr>
<tr>
<td>Usage Frequency</td>
<td>Estimated frequency of use and use cycles</td>
</tr>
<tr>
<td>Protection/Ethical Issues</td>
<td>Description of any protection or ethical issues related to the content of the data asset</td>
</tr>
<tr>
<td>Potential Reuses</td>
<td>Description of any potential re-uses that the asset managers can envision</td>
</tr>
<tr>
<td>Current Location</td>
<td>Path, location, or internet address of the asset</td>
</tr>
<tr>
<td>Source Location</td>
<td>Path, location, or internet address of the asset source (if third party sourced)</td>
</tr>
<tr>
<td>Relationships with Other Assets</td>
<td>Description of any relationships asset may have with other assets or departments</td>
</tr>
<tr>
<td>Version</td>
<td>Current version of the dataset</td>
</tr>
<tr>
<td>Long-Term Responsibility</td>
<td>Description of retention policy and management plans for the asset in the long-term</td>
</tr>
<tr>
<td>Long-Term Value</td>
<td>Description of the value of the data asset in the long term</td>
</tr>
</tbody>
</table>
Table 3—Audit Form 3B
The same small team, comprised of librarians from public services and assessment, data services, and collection management and technical services, is currently using the same methodology to audit library data globally.

Findings
The formation of the Assessment Working Group and its focus on multiple spheres of library data revealed library department silos. Such was the case with the circulation and collection management departments, where both have use for data generated by the other department. Circulation data stored by user type and subject classification proved to be incredibly useful to our collections management team who can apply this usage data to decision making when purchasing new materials or when weeding collections. Consistent and purposeful documentation, management, storage, and unencumbered internal access to these data will improve reporting, assessing, and creating vital returns on investment metrics.

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References

Putting a UX Lens on Library Space Assessment

Maurini Strub and Melissa Laning
University of Louisville, USA

Abstract
Libraries historically collect lots of different types of data. With the popular shift in moving from data collection to assessment that matches organizational goals, user experience can provide a framework for assessment efforts. The University of Louisville (UofL) Libraries re-examined its spaces in a heavily trafficked and utilized area completing and reporting an assessment in May 2014. Drawing on this assessment this paper covers best practices and methods to incorporate a user centered design to data collection. Rather than focusing on the data collected in the study, we focus on the methods, what they allowed us to learn, and how it can help inform others on collecting transformative data.

Purpose
In 2013, we decided to give our almost 35-year-old building an update. The décor is dated and anyone working in the building can tell you our users are often frustrated by the layout. The main library, Ekstrom Library, was completed in 1980, and several updates have been made over the years to refresh the interior and respond to technology or service delivery changes, but without the benefit of a comprehensive plan—or as our dean puts it, the building is like a city without any zoning laws. We had assessment data that addressed users’ satisfaction, but it was not the type of information that we could use to direct a renovation project and be sure our funds were well spent. We needed a new approach to assessing users’ space needs.

Background
In 2006, UofL built a two-story addition on the west side of the original building. In the new wing, a new entrance was added and Circulation was moved close to the new entrance. Media Services moved to the “old” front entrance and a popular reading collection with some armchairs was placed nearby, filling the space vacated by a coffee cart. Although the new entrance is architecturally the front of the building, most people still enter and exit in the old wing and have to go way off the beaten path simply to check out a book. Compounding the heavy use of the doors in the old wing was Media’s lending policies—they circulated all types of media and technology, but not books. These changes created what the staff on the first floor calls The Bounce—where users would be referred to multiple desks before their needs could be met. Additionally, though users appreciated the landing zone created by the popular reading collection right inside the front entrance, the book shelving created a visual barrier immediately upon entering. These results are just a few of the examples of how unplanned changes have impacted users.

Based on our colleagues’ anecdotal observations of and interactions with users attempting to navigate our space, we decided that techniques from the user experience (UX) tool kit offered the best approach to get the type of information we needed to sit down with designers. During the spring 2014 semester, we incorporated these tools into our assessment efforts.

Methodology
To start off, we deployed a small army of student assistants to conduct structured observations using a copy of the floor plan. They recorded the number of people seated in particular areas along with what devices and resources they had surrounding them. This gave us a good sense of the patterns of building use and non-use during an entire semester.

The second technique we employed was strategically placed whiteboards around the first floor bearing a question about how the space was being used as well as how respondents would like to use it. This provided even more detailed information about users’ preferences for our spaces. Questions and boards were designed to encourage interaction, rather than formally pose a question.
We also conducted a series of focus groups with users. Additional focus groups using a modified script were also conducted with library faculty, staff, student assistants, and partners in the building such as the writing center and a peer tutoring center.

Finally, we put our Libraries Student Advisory Board to work at their last meeting of the year developing ideal floor plans for the first floor using some of the preliminary data from the focus groups.

In borrowing these four techniques from the UX toolkit, we were able to learn about users’ emotional and cognitive responses to our environment, and start to understand what drives their behavior. Not surprisingly, all of these groups had quite a bit to say about how to improve the user experience. However, one of the most interesting and insightful conversations was with a group of student assistants who straddled the worlds of users and employees. Because they straddled the worlds of users and employees, they provided a unique perspective about how users navigated the facility and experienced our existing service delivery model. Learning how users made decisions, what visual cues were important in decision making, where they ended up as well as how they grouped themselves and arranged their workspace, could help us make some transformative changes to the first floor.

Recommendations

Over the space of 3 months, we were able to interact and engage with our users to hear firsthand about their challenges, obstacles, and triumphs. One advantage of our approach was that we enabled participants to determine what level of interaction they wanted to pursue. For example:

- The whiteboards allowed passive, casual, and quick feedback. In contrast, the focus groups/partner meetings allowed for more structured and in-depth exploration of issues.
- The anonymity of the whiteboards provided users the opportunity to freely talk about what bothered them. Those opting for focus groups began to freely share once they understood the value of the information that they were sharing.

There were several useful lessons that we learned that will be helpful in planning a renovation and new service model for our first floor. Here are some highlights.

- Be purposeful. Give users the tools for figuring how to do what they came in to accomplish.
- Let users utilize all of your tools. For example, users consider anyone at a desk an expert. Live up to that expertise, with good and knowledgeable service. Users are not concerned with credentials, but they do expect someone who can answer their questions.
- Compasses, sextants, and maps should not be necessary to find a space. Let color, lighting, furniture, and other architectural features be your users’ personal Magellan.
- Learn your buildings natural traffic patterns and use this knowledge to:
  - put service points near high traffic places;
  - co-locate like services;
  - make the most of your building’s decision points placing signs preferably within users’ sightlines; and
  - consider putting group activities closest to the highest traffic locations. Your users will thank you.
- Consider the value of proximity and convenience. In response to our designation of quiet/group floors, one user described “the commute to the 4th floor being too far” to find a quiet space, preferring to find quiet spaces on every floor.
- Choose to let your changes be more strongly influenced by the function of the space rather than letting the building’s spaces be dictated by form.
  - Let your signage be meaningful—that is clearly telling users what can be done. Signage should also be clear about what happens in the space (e.g., Ask for help here versus Reference).
  - Avoid piling on frustration at major ingress and egress points—when users are usually in the biggest hurry. In our case, we confused our users about what services were available at each entrance/exit by positioning the only place where a book could be checked out at the functional back of the building.
  - Work with users who are external to your organization. One of our compelling ideas came from the charrette exercise with our advisory board. Because they were not bogged down by organizational relationships, they came up with an
interesting solution to the desire for natural light.

Reflections
We had some surprising benefits from the process:
• We learned the importance of organizational buy-in and its influence on the level of employee engagement. Not only did it show where there was consensus and the conviction of the feelings but sometimes, hallway conversations continued beyond focus groups. These hallway conversations can be powerful in creating buy-in. Also, by including employees in this phase, it primed and gave them common ground for later conversations related to the project.
• Additionally, buy-in provided a means for increasing user engagement and excitement in the project. Focus group participants excitedly talked about looking forward to seeing the transformations in response to their feedback.

If we were starting this process over and had a longer time period to collect the data, we would implement a few changes to improve what we collected:
• The observations were a fairly passive process. By incorporating contextual inquiry, we could get a deeper perspective in understanding user behavior and decision making.
• Finding a way to follow-up on whiteboard feedback would allow us to explore the meaning behind some of the ideas presented. Perhaps, incorporating whiteboards at the start of a focus group and then closing with a few probes of whiteboard ideas would provide more meaningful feedback.
• In the case of our focus groups, recruiting from non-users (e.g., those preferring to study or work in another location), might also shed light on what enticed users to their preferred spaces. Additionally, though we had specific questions that we wanted answered, we could have utilized our quantitative data (e.g., computer usage and survey data) in order to define and refine some of the focus group questions.

Although we have not formally started our renovation or upgrade, we have already started making changes based on the information collection last spring. Having the right data to work with has made a significant difference. We now know much more about how and why our users interact with spaces in our library to supplement our previously collected data about what users are doing and how they feel about it.

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Notes


Viral Reference in the Writing Center: Using Metrics to Reinvent Library Reference

John Holmes and Kathleen Collins
University of Washington, USA

Our purpose is to develop a student and faculty support service in Odegaard Undergraduate Library that fully integrates student research and writing as conceptually and operationally inseparable processes. Developing metrics for a successful, sustainable learning service involving deep collaboration among student writers, writing tutors, and research librarians will inform assessment of the effectiveness of the new service against previous reference models featuring librarians at a service desk. In addition, the data will provide formative assessment for ongoing development of the integrated service.

Our team is developing structured intake and reporting forms embedded in an online booking system to capture client demographics and session-level learning outcomes. Intake will attempt to identify client-defined problems in research and writing that will facilitate follow-up, referral, and assignment of the appropriate consultation team for a session. Reporting data for research help sessions will be assessed against a 2011 two-quarter UW Libraries study of questions received at Odegaard’s former traditional reference desk using Gerlich’s Reference Effort Assessment Data (READ) Scale. We have modified the scale by eliminating the two lowest levels of service (e.g., directional queries and known-item searches) and have conflated the upper levels into two categories, one addressing needs that can be met in a single consultation and another addressing needs that are ongoing or require the use of multiple, asynchronous resources located in a variety of campus venues.

Analysis will focus on how the shift in service venue and focus impacts the nature of our work and the level of expertise, labor, and resources required to answer research queries. We have already noted a shift upward in the level of questions received. Data from the 2011 study indicate that over 70% of our queries were answered at the 1–2 level. While data from the earlier study indicate total queries for the academic year (extrapolated from 2-quarter data) in the range of 7,500, the OWRC expects to conduct approximately 17,000 inquiries during the current academic year, providing reference librarians access to queries previously unknown but embedded in writing challenges.

We expect that we will make more effective use of limited human resources by placing ourselves in the path of students seeking help in writing research-based papers. By eliminating the flow of directional and lower-order queries, we will be free to refocus on more sophisticated and powerful concepts helpful to students making their first efforts to join academic discourses. The OWRC may become a mechanism by which subject librarians throughout the UW system can be “discovered” more easily through referral and included in curricular consultation activities. In addition, as more academic libraries assess their commitment to the reference desk model in light of declining reference statistics (a 65% decline in ARL member institutions over the past 20 years) we search for a new and more effective approach to student learning of research and communication processes. Our current model may be valuable in informing other academic libraries in discussing revised services.

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Do Patrons Appreciate the Reference Interview? Virtual Reference, RUSA Guidelines and User Satisfaction

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Scholars Portal, Ontario Council of University Libraries, Canada

Dana Thomas
Ryerson University, Canada

Abstract
Much attention is paid to the RUSA Guidelines for Behavioral Performance of Reference and Information Professionals in the training and evaluation of reference librarians and virtual reference operators. It is not clear, however, that demonstration of these behaviors leads to better outcomes, or to more satisfied users.

Access to complete transcripts of interactions that occur on Ask a Librarian, a large-scale consortial academic virtual reference service in Ontario, along with the users’ responses to exit survey questions that address their satisfaction with the service and likelihood to return, provide a unique opportunity for assessment. With access to these transcripts, it is possible to measure whether the approach taken by the service provider, and the extent to which they adhered to the RUSA guidelines, correlate with user satisfaction regarding the interaction.

In this paper, we will describe an ongoing project to measure operator adherence to the guidelines in a sample of 400 virtual reference transcripts, and the development of original instruments (a behavioral assessment rubric and a user survey). The paper will outline the methodology used and share preliminary findings concerning the correlation between operators’ application of the behaviors recommended by RUSA and users’ satisfaction with the service.

The findings of this research have important implications for training and assessment of virtual reference services and operators and for future revisions of the RUSA guidelines by the American Library Association.

Introduction
Ask a Librarian, a collaborative virtual reference service coordinated by the Ontario Council of University Libraries (OCUL), has been providing chat-based research support to university students in the province of Ontario since 2011. The twelve university libraries that participate in the collaboration contribute staff time to the service and assist each other’s users with library and research related inquiries. Together, the libraries are able to offer the service sixty-seven hours each week, more than any of them could provide with their local resources alone. The staff time contributed by participating libraries is supplemented by a group of mentees—students and recent graduates of master’s level programs in information studies, who are trained and paid for their work on the service. To date, more than 60,000 users have been served through Ask a Librarian chat.

Chat data
LivePerson, the chat software that powers Ask a Librarian, retains extensive data about the activity of the service and about each interaction. Among other data, it collects each user’s responses to a mandatory pre-chat survey (Fig. 1).
The system also retains a complete transcript of each chat, including timestamps of all messages sent by users and operators, as well as users’ responses to an optional exit survey. This exit survey asks a number of questions about users’ satisfaction with the service they received (Fig. 2).

Figure 1. Mandatory pre-chat survey

Figure 2. Optional exit survey
To date, each question in the survey has received more than 6,500 responses, and the overall user sentiment is overwhelmingly positive. For example, one of the questions in the survey asks respondents to complete the phrase: “the service provided by the librarian was...” Respondents are able to choose from five answer options: excellent, good, satisfactory, poor, and very poor. Of the 6,831 responses submitted to date, 71% state that the service was excellent. Another 20% said the service was good, and 6% rated the service as satisfactory. A combined 4% rated the service as poor or very poor. Responses to the other questions in the survey are similarly positively skewed. Figure 3 shows the responses to this question within the sample analyzed in this study, which are similar to (and thus representative of) the Ask a Librarian general user population.

Figure 3. User satisfaction within study sample (N=100)

<table>
<thead>
<tr>
<th>User Satisfaction</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>71</td>
</tr>
<tr>
<td>Good</td>
<td>25</td>
</tr>
<tr>
<td>Poor to Satisfactory</td>
<td>4</td>
</tr>
</tbody>
</table>

Training of new Ask a Librarian operators and mentees places much emphasis upon effective written communication and the reference interview technique as framed in the Guidelines for Behavioral Performance of Reference and Information Service Providers published by the Reference and User Services Association (RUSA). We infer that the consistently high user satisfaction ratings received through the exit survey are due in part to this emphasis on the RUSA framework and service excellence. In early 2014, we decided to empirically test this assumption to facilitate evidence-based enhancements to our service philosophy and training program.

Methodology
The study was designed to measure the degree to which performance of the behaviors recommended in the RUSA guidelines exerts an influence on user satisfaction. It employs content analysis methodology and involves careful examination of the behaviors exhibited by chat operators. Four hundred transcripts from the 2013–2014 academic year were randomly selected and were redacted to remove information that may identify the user or the operator. We analyzed and coded each transcript using an original instrument (Fig. 4): a rubric designed to enable us to measure each operator’s performance on 10 of the behaviors recommended in the guidelines. Assigning each operator a total grade to reflect their level of adherence to the guidelines allowed us to determine how different levels of adherence impacted user satisfaction. For the purposes of this analysis, we interpret users’ responses to the survey question “the service provided by the librarian was...” as a proxy for their satisfaction with the operator’s performance.
Figure 4. Rubric for measuring RUSA recommended behaviors in virtual reference transcripts

<table>
<thead>
<tr>
<th>Category</th>
<th>Approaches guidelines</th>
<th>Adheres to guidelines</th>
<th>Exceeds guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Approachability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Greeting [2.1.5]</td>
<td>No greeting or curt greeting</td>
<td>Greets user</td>
<td>Greets user by name with friendly and personalized message</td>
</tr>
<tr>
<td>2. Timeliness [3.2.1 and 2.3.1]</td>
<td>Slow to greet (longer than 1 minute)</td>
<td>User greeted within 30-60 seconds</td>
<td>User greeted in under 30 seconds</td>
</tr>
<tr>
<td><strong>Interest</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Engagement and tone [3.1.1 and 3.1.2]</td>
<td>Distracted or rude</td>
<td>Professional and courteous tone</td>
<td>Multiple expressions of interest in the user's question and feedback</td>
</tr>
<tr>
<td>5. Questioning [3.1.7 and 3.1.8]</td>
<td>Does not ask questions needed to uncover full question or need</td>
<td>Uses questioning to clarify question or need</td>
<td>Consistently engages in confirming understanding and user responses applied throughout</td>
</tr>
<tr>
<td>6. Listening and confirming [3.1.5]</td>
<td>Answers an ambiguous or high level question without confirming mutual understanding</td>
<td>Repeats or rephrases the user's query to confirm understanding initially</td>
<td>Consistently engages in confirming understanding and user responses applied throughout</td>
</tr>
<tr>
<td><strong>Searching</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Collaboration [4.1.4 and 4.1.5]</td>
<td>Does not include the user in topic negotiation, resource selection, or evaluation of results</td>
<td>Evidence of collaboration with the user to refine topic, evaluate results and alternative resources</td>
<td>Fully involves the user in all stages of the search process</td>
</tr>
<tr>
<td>8. Instruction [4.1.7 and 4.1.8]</td>
<td>Provides incomplete explanations or instructions for the user to follow</td>
<td>Fully explains search strategy or process to the patron</td>
<td>Fully explains search strategy and utilizes teachable moments. The user learns something new</td>
</tr>
<tr>
<td>Follow up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Satisfaction check [5.1.1]</td>
<td>Does not perform a satisfaction check</td>
<td>Performs a satisfaction check</td>
<td></td>
</tr>
<tr>
<td>10. Closing [5.3.1]</td>
<td>Does not invite the user to return</td>
<td>Invites the user to return</td>
<td></td>
</tr>
</tbody>
</table>

This study builds upon similar work by others but is unique in its ability to tie an operator's performance directly to the user's satisfaction through the data collected in the exit survey. The rubric in Figure 4 is also unique to this project. Creating an original rubric enabled us to select and quantify some of the behaviors recommended in the guidelines using our own understanding of virtual reference best practices. Creating and revising the rubric and scope notes ourselves ensured that we had a thorough understanding of the meaning of each distinct category—a factor that, with practice, enabled us to achieve strong inter-rater reliability.

**Data analysis**

To date, we have analyzed 100 of the 400 transcripts in our random sample. In order to maintain as much objectivity as possible, we did not evaluate transcripts from our own institutions. Although the operator names were redacted, familiarity with personal communication styles and expressions meant that we could still potentially identify individuals from our own institution. Each transcript was read and assigned either a score or a “not applicable” designation for each item on the rubric. This was done through close comparison against our rubric's definitions and scope notes. As we worked through the transcripts, several revisions to these definitions were needed as cases arose that did not fit within our original categories, and where definitions were found to contain ambiguity that made it difficult to determine how a transcript should be scored. All transcripts that were scored using earlier drafts of the rubric were reread and rescored every time the rubric's categories were modified. The majority of items on our rubric could receive a maximum score of 3, for exceeding the service standard, a 2, for adhering to the standard, or a 1, for approaching the standard. For three of our items (questioning, satisfaction check, and closing), we were looking only for the presence or absence of that behavior within the transcript, so those items' maximum and minimum possible scores were 2 and 1 respectively. Not applicable (N/A) designations were possible for the latter six items on our rubric under specific circumstances (see Table 1). For example, if a user indicated that they had been fully assisted to their satisfaction and were leaving the chat (i.e., “Thanks, that is exactly what I needed. Goodbye.”), a satisfaction check and closing message would have been redundant. The item “questioning” was not applicable to questions that were assessed as absolutely unambiguous or fully stated by the user in the pre-chat survey. “Listening and confirming” applies only to ambiguous or high-level questions, or where it is necessary to confirm a user's knowledge or expertise. “Collaboration” applies
only to research questions, and “instruction” only to questions that include a search or a process.

Rubric scores and exit poll surveys were matched using their ID numbers and combined within a single Excel spreadsheet, which was then imported into SPSS for analysis. In order to test for relationships, crosstabs with chi-squares were run for each item on the rubric against service quality (the exit poll question proxy for satisfaction described above). We also ran descriptive statistics to identify the frequencies with which operators approached, adhered, or exceeded the RUSA guidelines for each item on our rubric.

Findings
Preliminary findings based on our analysis of the first 100 chat transcript and exit poll pairs indicate that our operators are performing at a high level as measured by our rubric (see Table 1). We were pleased to find that operators are adhering or exceeding the guidelines on a majority of the items much of the time. Checking to see if the user received enough help, conducting a satisfaction check, including a closing phrase (inviting the user to return), and providing instruction are weaker areas that we may want to emphasize in operator training.

Table 1. Frequencies by RUSA behavior

<table>
<thead>
<tr>
<th>Rubric Item</th>
<th>Exceeds (3)</th>
<th>Adheres (2)</th>
<th>Approaches (1)</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greeting</td>
<td>43</td>
<td>55</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Timeliness</td>
<td>92</td>
<td>7</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Contact</td>
<td>30</td>
<td>41</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Engagement/Tone</td>
<td>10</td>
<td>87</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Questioning</td>
<td>-</td>
<td>66</td>
<td>23</td>
<td>11</td>
</tr>
<tr>
<td>Listening</td>
<td>3</td>
<td>12</td>
<td>23</td>
<td>62</td>
</tr>
<tr>
<td>Collaboration</td>
<td>1</td>
<td>15</td>
<td>6</td>
<td>78</td>
</tr>
<tr>
<td>Instruction</td>
<td>11</td>
<td>24</td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>Satisfaction Check</td>
<td>-</td>
<td>38</td>
<td>53</td>
<td>9</td>
</tr>
<tr>
<td>Closing</td>
<td>-</td>
<td>17</td>
<td>79</td>
<td>4</td>
</tr>
</tbody>
</table>

Our chi-square tests revealed that relationships between three items on the rubric and service quality are significant or are nearing the 0.05 p value.
Table 2. Timeliness and service quality

<table>
<thead>
<tr>
<th>Service Quality Approaches</th>
<th>Timeliness</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adheres</td>
<td>Exceeds</td>
<td></td>
</tr>
<tr>
<td>Poor to Satisfactory</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>0.0%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Good</td>
<td>0</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>71.4%</td>
<td>21.7%</td>
</tr>
<tr>
<td>Excellent</td>
<td>1</td>
<td>2</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>28.6%</td>
<td>73.9%</td>
</tr>
</tbody>
</table>

Timeliness, or the speed at which the operator answers the user’s initial request for a chat, is nearing significance ($p=0.06$). Table 2 demonstrates that exceeding the guidelines is related to a rating of excellent on the exit polls, and adhering relates to a rating of good. 73.9% of operators who scored “exceeds” on timeliness also received an “excellent” rating by users in the exit poll survey. 71.4% of operators who scored “adheres” received a “good” rating by users.

Table 3. Contact and service quality

<table>
<thead>
<tr>
<th>Service Quality Approaches</th>
<th>Contact</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adheres</td>
<td>Exceeds</td>
<td></td>
</tr>
<tr>
<td>Poor to Satisfactory</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>0.0%</td>
<td>7.3%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Good</td>
<td>10</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>34.5%</td>
<td>31.7%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Excellent</td>
<td>19</td>
<td>25</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>65.5%</td>
<td>61.0%</td>
<td>90.0%</td>
</tr>
</tbody>
</table>

Maintaining contact, or the absence of frequent or prolonged silences, is a significant relationship ($p=0.035$). Ninety percent of operators who exceeded the guidelines for maintaining contact received a rating of “excellent” in their exit polls. Contact refers to the number and duration of “silences” where the operator hasn’t responded to the user’s last message within a particular duration of time. Where all responses were sent by the operator within 60 seconds of the user’s last message, and where any brief silence of less than two minutes was explained in advance, that operator received a rating of “exceeds” on the contact rubric item. Adhering to the guidelines was defined as between one and three unexplained silences no longer than two minutes, and any silences between two and five minutes included a warning in advance.
Table 4. Tone and service quality

<table>
<thead>
<tr>
<th>Service Quality Approaches</th>
<th>Tone</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adheres</td>
<td>Exceeds</td>
<td></td>
</tr>
<tr>
<td>Poor to Satisfactory</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>33.3%</td>
<td>3.4%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Good</td>
<td>1</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>33.3%</td>
<td>23.0%</td>
<td>40.0%</td>
</tr>
<tr>
<td>Excellent</td>
<td>1</td>
<td>64</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>33.3%</td>
<td>73.6%</td>
<td>60.0%</td>
</tr>
</tbody>
</table>

“Adhering” to the guidelines for tone means that the operator displayed a polite, to-the-point demeanor throughout the chat. “Exceeding” was defined as using more than two expressions of interest. These expressions could include the use of exclamation marks or expressions of interest, such as, “what a great question.” Though not a significant relationship ($p=0.064$), we see that 73.6% of operators who adhered to the RUSA guidelines for tone as measured by our rubric, received an “excellent” rating by users in the exit poll surveys. It is less clear whether, and to what extent, users appreciate expressions of interest. Here, adhering to the guidelines may result in better service than exceeding them, but we are not able to establish this firmly with our initial results.

Limitations
Our findings are influenced by the way we defined approaching, adhering, and exceeding in our rubric, and by how we interpret the conversations represented in our chat transcripts. We worked hard to mitigate this, but some element of subjectivity will always be present due to the nature of our research. We are also challenged by the extremely small proportion of negative exit polls in our random sample, and can only draw tentative conclusions due to our small sample analyzed to date.

Conclusions
Initial findings lead us to conclude that users seem to appreciate being greeted right away, prompt replies, and a polite, to-the-point tone. Because timeliness and contact seem to be the most important aspects of the chat service in terms of user satisfaction, operators providing chat service should be mindful of the number and duration of silences that the user experiences. During in-depth research help transactions, it is often necessary for the operator to “step away” from the user while they do some preliminary groundwork. In these cases, a warning message should be provided so that the user does not feel that they have been abandoned. We noted that silences may be experienced differently depending upon whether the user is active (co-searching with the operator) or passive (waiting for the operator to return), so that a longer, active silence is not interpreted as being as long a silence as a shorter, passive one. This consideration was beyond the scope of our research but may be worth pursuing in further research.

Next Steps
We expect to see some stronger correlations as we analyze the remaining 300 transcripts from our sample. Also, because of our positively skewed data, we plan to analyze all of the negative poll transcript pairs separately from our random sample. This will enable us to compare variations in operator adherence to the guidelines, looking for differences between positive and negative interactions. Finally, we will conduct an analysis of the open comments included in the exit surveys to look for patterns and themes related to our research.

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Acknowledgements
Thank you to Debbie Green (head, reference and research department, Robarts Library, University of Toronto) for her feedback on our rubric, and to Andie Noack (undergraduate program director,
Department of Sociology, Ryerson University) for reviewing our data analysis strategy.

Notes


Bibliography


Radford, Marie L. “Approach or Avoidance? The


The purpose of this paper is to report on work being done by Curtin University in Perth, Western Australia to bring up to date an old library idea: the “materials availability survey.”

Importance of finding specific items
Curtin Library is of the belief that, even in today’s world of clients having access to millions of resources, there are times when they still need a specific item. For example:
- undergraduates may need a book or journal article on the reading list for their course;
- postgraduates may need an item for their thesis/dissertation literature search; or
- academics may need a cited paper for a research project.

Support for this belief was provided by recent client surveys run by the library in which both undergraduates and postgraduate students continued to record high mean importance scores (in excess of 85%) for the factor “The items I am looking for on the library shelves are usually there.”

Traditional materials availability surveys
In the past, to test how well their library was actually performing in this area, Australian libraries periodically ran a materials availability survey, based on one developed for the Council of Australian University Librarians (CAUL). The strength of such surveys was that they provided the library with information based on actual client searches and practice regarding the level of failure clients experienced and where library efforts need to be directed to rectify problems.

These surveys traditionally followed a number of steps:
1. Library staff intercepted clients as they entered the library and handed them a survey form. Clients were asked to search for items on the shelves in their normal way but then record on the survey form:
   - What item were they looking for in the library?
   - Did they find it?
   - If they did not find it, why not? For this clients were provided with several multiple choice options including: the library does not own the item; all the copies are at another campus or out on loan or not on the shelves; it is supposed to be available electronically but I can’t access it.

2. Clients placed their completed form into a survey returns box.
3. Library staff verified each client’s response including:
   - Does the library actually own the item?
   - Is the item supposed to be on the shelves or did the client misread the catalogue record?
   - Is the item in its correct place on the shelves or is the client searching in the wrong place?

From this the library could compute:
- What percentage of items did clients actually find?
- For the items clients did not find, what percentage was due to “library failure” and what percentage “client failure.” “Library failure” included failure to acquire sufficient copies, failure to locate these at an appropriate library branch, missing items, etc. “Client failure” encompassed making an error searching the catalogue, identifying the correct location, interpreting loans status information, and failure searching library stacks.

4. The library could then develop an action plan to reduce failures in the future and re-run the survey periodically to see if client success had improved.

When Curtin Library ran its first materials availability survey in 2005, it was horrified to find that 58% of clients had not found what they were looking for. By 2010, through making...
improvements in the library (purchasing additional copies, improving the wording of catalogue displays, simplifying library layout and signage, etc.) this rate had been halved to 26%.

Obstacles to traditional materials availability survey methodology
There are a number of reasons why the traditional methodology for materials availability surveys is no longer appropriate. Many clients coming into the library are not there to find items, but instead they may be looking for a computer or group study space to use. Many clients who are looking to find items are not in the library—they are at home, in their office or using a mobile device. Many of the items clients are looking for do not need to be found on the shelves in the traditional way—they can be accessed online.

So in Australia at least, materials availability studies have largely been abandoned. Instead, libraries have gone back to assuming that, because they are making so many more items available to clients, more conveniently and with more search options available to find them, clients must be finding what they are looking for, or something else that is satisfying them. However, if the ability to find a specific item where and when you want it is still important, these may be dangerous assumptions.

Searching for an alternative materials availability methodology
In seeking alternatives to the traditional materials availability survey, Curtin looked first at the MINES for Libraries survey developed in North America. While the interception methodology used in this survey was found to be useful, the timing of the intervention prior to the client attempting to find or access the hardcopy or electronic item they were searching for, meant that this survey could not assist the library to establish the percentage of clients able/unable to find what they were looking for.

Curtin Library therefore set out to develop a version of the traditional materials availability study relevant to current academic library conditions, which would answer this question. To date, the library has run one pilot of the methodology and it intends to run an improved version later this year. A larger scale survey will be run in 2015.

The revised materials availability methodology
The revised methodology adopted for Curtin Library’s updated materials availability survey can be described briefly as follows. It should be noted that Curtin Library uses ExLibris’ Alma system and the PRIMO discovery layer.

• A computer program was developed to identify when either the catalogue home page or the catalogue search results page from the library’s website were displayed. Custom software was written such that, if one of these pages were displayed, there was a 5% chance of a survey invitation pop-up being displayed. The custom software was written to integrate with PRIMO but could be adapted for other library systems.

• The invitation pop-up asked whether the client was looking for a specific item in the library and, if so, whether they would be willing to assist by participating in the study. If the client was willing to participate, they were asked to provide an e-mail address where they could be contacted; if not, they were thanked and returned to their search.

• Clients who had agreed to participate were sent an automatic e-mail providing a link to a web-based survey tool hosted on the third-party system, SurveyMonkey.

• Participants were asked to complete the survey when they had looked for the item they were searching for in the catalogue when they were intercepted, i.e., when they had looked for it on the library shelves or tried to access it electronically. The survey form on SurveyMonkey was a modified web version of the traditional materials availability survey form used at Curtin, adapted to provide for the possibility of clients trying to find an electronic resource.

• In a full survey, library staff would be alerted to the submission of the SurveyMonkey survey immediately, so they could investigate any items that respondents reported they had been unable to find. This was not done for the pilot but remains an essential part of the methodology.

A “permanent cookie” was used so that a client who was presented with the pop-up invitation once would not be presented with it again during the
life of the survey. The library could have opted for a “session cookie,” whereby the client would not have been presented with the pop-up invitation again within the same session, but could have been presented with it in subsequent sessions. However there was concern that clients would find this annoying.

The library could have avoided requiring clients to input their e-mail address, for example by developing an interception method which identified who the client was or by asking the client to input their user or student/staff identification number, from which their university e-mail address could be derived. However this was not done as it could have raised some privacy issues or objections about the inappropriate use of their university e-mail address. The library preferred clients to “opt in” to the survey by supplying their e-mail address, rather than providing for them to “opt out.”

Response rate
The pilot survey was run for three days (66 hours) between Tuesday 29 October and Friday 1 November 2013. During this time, 800 catalogue searches were intercepted. One hundred fifty-seven clients agreed to participate and provided an e-mail address. Of these, 76 clients clicked on the link to the survey and 55 completed it. Taking the 55 respondents who completed the survey out of the 157 who indicated (by supplying an e-mail address) that they were prepared to participate, results in a response rate of 35%.

It should be noted that very little promotion of it was done and no incentives for participating were offered.

Compared with traditional materials availability survey distribution methods, the 55 responses obtained in the pilot were achieved with very little effort on the library’s part once the methodology programming and development had been done. When Curtin Library last ran a materials availability survey, 16 hours of staff time were devoted to handing out survey forms to clients as they entered the library building. This task was not necessary with the new methodology.

Results
Of the 55 clients who provided usable responses to the survey, 33% reported that they had not found the item they were looking for. Although, since the study was a pilot, library staff did not attempt to ascertain the reasons for clients’ lack of success, it is known that many of the items they were looking for were available and accessible electronically at the time of the survey.

While the response rate was a little disappointing and the figure of 33% of clients not finding what they were looking for was of concern, on the positive side the pilot did demonstrate that the methodology developed could be successfully implemented.

Issues and possible improvements
Since conducting the initial pilot, the library has reflected on the methodology and how it could be improved in the future.

System-dependence of interception
It was intended that the program developed for intercepting catalogue searches would be system-independent. However the solution developed for the pilot included components which were tied specifically to Curtin Library’s server infrastructure and the Curtin Library catalogue. The library’s programmers feel that this could be overcome if they had more time to develop the solution and now that they have a better understanding of what is being sought.

Bias in interception method
The method adopted was biased towards clients who were doing multiple searches or paging through multiple pages of search results—each search result page had a 5% chance of triggering the invitation pop-up. To overcome this, the library is now investigating using an additional “session” cookie on the search results webpage to remove the pop-up trigger during search result paging or further searching.

Placement of invitation pop-up
The programmers managed to get the invitation pop-up to work on four different web browsers. However getting it to display properly on a mobile phone was a challenge.

Survey delivery by e-mail versus pop-up link
Curtin Library wanted clients to complete the survey after they had looked for the item. It was for this reason the link to SurveyMonkey was e-mailed to them rather than linking to it in the invitation pop-up.
However, it was found that many clients went straight to the survey and completed it before they had tried to find their item. It would be preferable if clients who have agreed to participate could follow the e-mailed link to the survey straight away and (before they forget it) they could input the details of what item they were looking for at the point of interception. Ideally they would be able to stop at this point and save their response, then return to complete their survey only after they had actually tried to find the item. While it has been found that technically this can be done, it would require each client to be e-mailed a unique, personalised survey link and a perceived loss of anonymity in client responses could result.

**Automatic population of sought item details**
To save clients’ time, consideration was given to having survey forms automatically populated with a citation for the item the client was seeking. However, this was not done as it was decided that the way in which the client writes down the details of what they were looking for could provide some explanation of why they subsequently do not find it.

**Detection of completed surveys**
Both the traditional and the revised methodology rely upon the client submitting their survey form as soon as possible after they have tried to find an item, and library staff being alerted to its submission, so that a library staff member can search for the item with as little delay as possible. Any delay could result in the circumstances in which the library staff member is searching for the item being different from the circumstances in which the client searched, invalidating results. An alert will therefore need to be developed for library staff signalling that a SurveyMonkey form has been lodged and that action on it needs to be taken as soon as possible.

Curtin Library believes that all of the challenges and refinements outlined above are manageable. The biggest obstacle will be the final detection and verification stage since clients are able to access electronic items 24 hours per day, 7 days per week and, in many libraries including Curtin, can access library buildings to find and borrow print materials long after most library staff have left work for the day.

**Conclusion**
Traditional materials availability surveys were a valuable tool for libraries to assess whether their clients were finding the items they were actually searching for, the reasons for their failures and what corrective action needed to be taken to increase success in the future.

Investigations at Curtin University Library in Western Australia suggest that while the ability to find library items remains important to clients, a high percentage of them may be continuing to experience difficulties.

Since the types of library items clients are searching for and when, where and how they are searching has changed since materials availability surveys were developed, a revised methodology is needed. Curtin Library has commenced and is committed to this work which, if successful, it intends to share with the library community for the benefit of all our clients.

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Abstract
Academic Analytics is a subscription database and analytic tool that enables university administrators to monitor the scholarly and research productivity of their institutions, while also allowing for comparison against that of their peers or other institutions nationally. This study capitalizes on Academic Analytic’s department-level scholarly productivity data to explore a variety of different disciplines in order to determine if their productivity is related to the level of investment that their universities make in their libraries. The scope of the study includes all US doctoral institutions. The goal is to test the proposition that those universities which furnish their research communities with well-resourced libraries should experience increased levels of scholarly productivity, and to such a degree that it is empirically detectable. It builds upon two previous studies that each found scholarly productivity to be significantly and positively correlated to increases in library expenditures—particularly electronic library material expenditures—while controlling for other important institutional characteristics that are likely to influence scholarly output, such as faculty size and research expenditures. While the earlier studies examined total scholarly output at the institutional level, this study digs deeper to explore scholarly productivity at the discipline level by separately examining art history, psychology, and engineering as well as the broader groupings of the social sciences and the health and life sciences, to determine if the positive findings of the preceding studies holds true across a variety of fields. The results show that increased library resources are associated with increased productivity in each of the disciplines analyzed here. While electronic library material expenditures remain the library resources most associated with scholarly productivity for the social sciences and the health and life sciences, the art history findings suggest that print material expenditures remain highly relevant monographic scholarly productivity in the humanities. Meanwhile, engineering productivity correlates strongest with overall library expenditures rather than any one particular resource.

Purpose and Concept
Both the present study and its two predecessors share the same two broad objectives. The first is to uncover empirical evidence suggesting that universities produce more scholarship when they invest more in their libraries. The implication of such a finding is that universities can expect a return on their library investment—even though proving causation is unobtainable and the calculated parameters of such a return are not precise. Nevertheless, the observation of such an empirical relationship combined with assumptions about how and why library resources might impact scholarly productivity can make a more powerful argument in favor of adequate library investment rather than relying on assumptions alone. The second objective is to explore which library resources are most associated with increased levels of scholarly productivity, and in the case of the current study, whether those resources vary across disciplines. This goal is particularly relevant to the current study, because the previous studies each found that expenditures for print materials were negatively associated with productivity when examining institutional-level productivity data. Thus a major impetus for conducting a discipline-level analysis is to see whether the negative correlation between print and scholarly productivity is in some way a side product of earlier studies that blended the scholarly output of humanities, art, and professional programs together with STEM-H fields by virtue of studying scholarly productivity at the institutional level, or if this negative relationship regarding print expenditures truly persists across all fields.

Previous Studies
All three studies have a similar design, whereby the concept of faculty scholarly research productivity
is operationalized as the number of journal articles produced by a doctoral institution or, in the case of the current study, the number of journal articles produced by a particular department within a university. This journal article output is then compared against a variety of library and institutional variables using regression analysis to determine which characteristics are most associated with higher levels of journal article output. The aspiration, of course, is that some of the library characteristics will prove to be positively correlated with journal article output.

The first study relied on Thomson Reuters Web of Science to aggregate and assign the total number of journal articles attributable to each US doctoral university from 2005 to 2011. This journal article output data served as the dependent variable of the regression model while a number of library measures taken from ACRL’s Academic Library Trends and Statistics Survey (e.g., total library expenditures, library material expenditures, number of professional staff, etc.) and an abundance of nonlibrary institutional measures taken from the US Department of Education’s Integrated Postsecondary Education Data System (e.g., faculty size, university revenue, research expenditures, research salaries, etc.) served as the independent or explanatory variables. Nonlibrary data was needed in order to introduce as many of the predictors of journal article output into the model as possible, because, for example, the number of faculty at an institution or the amount of research funding they receive is likely to influence scholarly productivity in a significant fashion. Only by including these variables can a suitable context be established for exploring the connection between library variables and levels of scholarly production.

As previously stated, the principal finding of this study was that electronic material expenditures were strongly associated with increases in scholarly productivity and more so than other library expenditures or resources. Perhaps more interesting, the findings also indicated that scholarly productivity dropped as more of a library’s collection budget was dedicated to print. It was unexpected to find a negative and statistically significant correlation between print expenditures and scholarly productivity. Certainly print materials support the research of a variety of scholars. It would have seemed more reasonable if the analysis had produced a positive correlation, or even no correlation, rather than the observing that less scholarship was being produced with each additional dollar spent on print. An explanatory theory was forwarded suggesting that these findings could represent an opportunity cost. The concept is that electronic library materials offer efficiencies in terms of speed of access and ease of use, which save researchers time when compared to accessing and using print materials. The thinking goes that when these time savings are multiplied by each member of a university’s research community, the aggregate time savings are significant enough to be noticeable in a study such as this. Therefore, as more of a library’s collection budget is dedicated to print, the less it has to spend on electronic materials or to leverage their time saving efficiencies. To rephrase, the idea is that a research community at an institution well-resourced in electronic library materials should be able to complete an equivalent amount of scholarly work in less time than if the same researchers were at an institution that was poorly resourced in those materials.

The second study was initiated to see if the results of the first would be replicated using a different source for dependent variable data and a slightly different population. Whereas the first study turned to Web of Science for determining the number of journal articles produced at each doctoral institution, the second study used Academic Analytics, which relies on CrossRef for journal article counts. Furthermore, while the first study counted the scholarly work of any author who had an organizational affiliation with an institution, Academic Analytics counts only the scholarly works of those professors who have appointments within one of the institution’s PhD programs—thus the focus is on a smaller subset of a university’s research community. The results were very similar to the first study. Electronic library material expenditures were again the library characteristic most associated with scholarly productivity and print material expenditures continued to demonstrate a negative relationship to productivity that was statistically significant.

Data
The different measures that Academic Analytics collects regarding program-level scholarly research productivity are listed below. These measures are the basis by which Academic Analytics renders a variety of graphs, charts, and other analysis.
features that allow users to explore how each of their programs rank nationally against other programs within the same Classification of Instruction Programs (CIP) code. A subscribing institution can also view the raw data for each of its programs and their national counterparts. It is this raw data that is the basis for this study. It is important to note, however, that subscribers can only view data for programs that correspond to an existing program at their own institution. If your institution does not offer a doctoral program in history, for example, then you will not be able to view productivity data for that discipline. This makes sense, of course, given the intended use of Academic Analytics. Not too many administrators are eager to monitor the productivity of programs that do not exist at their institution. This does limit the scope of inquiry for this study, however, by narrowing the analysis to only those fields that are represented among my institution’s (Virginia Commonwealth University) 40 doctoral programs. Because of this reality, the representation of disciplines selected for this study are, to some degree, based on what data was available through VCU’s subscription.

Academic Analytics offers the following doctoral program-level measures:

- Number of department faculty members
- Number of journal articles published by the department’s faculty from 2009 to 2012
- Number of books published from 2003 to 2012
- Number of conference proceedings from 2009 to 2012
- Number of citations received from 2008 to 2012
- Number of federal grants received between 2008 and 2012
- Dollar amount of federal grants received between 2008 and 2012
- Number of awards received (varying lengths of time)

A variety of additional variables are then derived from these measures, such as percentage of department members with a grant or dollars per grant.

**Dependent Variable Data**

One of these derived variables, articles per faculty member, was used as the dependent variable rather than the total number of articles attributed to the department. The logic of using a per faculty member measure is similar to the logic of using per capita GDP when comparing the economies of different nations—it transforms GDP into a proportional measure that allows for more accurate comparison between economies of varying sizes. The faculty count for each department is as of fall 2013 and the associated journal output for each faculty member looks backwards to articles published between 2009 and 2012. If a faculty member changed institutions at any point within that period, then all publication counts for the entire period would be attributed to the new department.

**Independent Variable Data**

Library variables were obtained from the ACRL survey and are compiled as averages between the years 2008 to 2011 in order to represent a period just preceding the date range of the journal publication data—the assumption being that library-use occurs earlier in the research cycle than the publication of findings. The primary limitation of the ACRL data is that it is self-reported. Another issue is that some institutions had incomplete library data which necessitated their exclusion from the dataset.

The library variables include:
The nonlibrary institutional variables were collected from both IPEDS (2008 to 2011) and Academic Analytics (2008 to 2012). Variables for the number and dollar amount of federal grants awarded to each department were pulled from Academic Analytics. These grant measures are limiting because they include only the thirteen largest federal grant-funding agencies while excluding other sources of grant funding such as corporate, nonprofit, and state sponsorship. However, the advantage is that this grant data pertains exclusively to the department being studied, while other readily obtainable sources of grant funding data tend to be aggregated at the institutional level. Nonetheless, some institution level measures of research expenditures were also included to provide a measure of each institution’s overall research activity. These measures were obtained from IPEDS and include total research expenditures, research salaries, research operation-plant maintenance expenditures, and depreciation. Other institution variables from IPEDS were included to provide an indication of each institution’s overall financial strength, with the assumption that stronger institutions may be better positioned to support scholarly productivity. These financial variables include total university revenue and the 2010–2011 fiscal year-end value of the endowment. Like the library data, a limitation of IPEDS is that its data is also self-reported.

**Methodology**

A separate linear regression model was constructed for each discipline or grouping of disciplines studied. Each discipline’s model, except art history, featured the number of published articles per faculty member for each department at each doctoral institution from 2009 to 2012 as the dependent variable while each of the independent variables listed above were tested for suitability as explanatory variables.

Individual departments serve as the unit of analysis for art history only. For the other groups, individual departments in the same discipline or grouping are collapsed into a single case per university. For example, if an institution features five separate PhD-granting engineering programs, the data for all of those departments are aggregated into a single case, making the institution’s combined engineering programs the unit of analysis, rather than five separate cases. The reason for this is because the library data is university-wide. If the university’s engineering departments were analyzed as five separate cases, then same library data would be introduced into the dataset five times instead of once.

**Parameter Requirements**

For any independent variables to be included as an explanatory variable in a final regression model, it needed to fit two parameters: it had to have a p-value of .05 or lower and could not have a correlation with another independent variable that exceeded a variance inflation factor (VIF) of 10. The reason for the latter requirement is that much of the independent variable data collected for this study suffers from multicollinearity, whereby two or more independent variables are so highly related to one another that it severely diminishes the ability of the analysis to determine either variable’s relationship to the dependent variable. For example, the change in the number of library staff and library personnel expenditures from one institution to the next are so similar that these measures are practically surrogates for one another. Because these two independent variables measure essentially the same thing, their simultaneous inclusion in the same regression model produces unreliable coefficients (the value representing each independent variable’s relationship to the number of articles per faculty). Therefore, in these cases only one of the independent variables could be included in the regression analysis in order to achieve meaningful coefficients.

To determine which independent variable should remain, separate models were run, each featuring
only one of the highly correlated independent variables along with the other statistically significant independent variables that did not have multicollinearity problems. The one that produced the highest standardized coefficient was selected for the model and the other(s) was excluded.

Finally, the analysis was conducted primarily using the auto-regression feature in SPSS. The previous studies relied on the traditional linear regression option. The primary difference between these two modes—at least with this study—was that the auto-regression feature transformed some of the independent variables by trimming outliers. Each of the models were run in both modes and generally achieved the similar results, but the findings discussed here come from the auto-regression output exclusively.

**Results**

Electronic material expenditures continued to be the library characteristic most strongly correlated with increased scholarly research productivity in three of the five discipline areas studied: the health and life sciences grouping, the social sciences grouping, and psychology (when broken out from the broader social sciences grouping). As was the case in previous studies, research productivity was also strongly associated with the number of grants, research expenditures, and the institution’s overall financial strength. Unlike previous studies, print material expenditures were not negatively associated with research productivity in any discipline and, in fact, were strongly associated with research productivity in art history. Finally, the scholarly production in the engineering grouping was more strongly associated with overall library expenditures than any particular library resources, including electronic material expenditures.

**Health and Life Sciences**

The regression model for this grouping included research expenditures, number of grants, electronic library material expenditures, and the overall financial strength of the institution as explanatory variables for scholarly productivity (see Figure 1). All the coefficients signal a positive relationship and each variable had a p-value below .01. Other grant-related and library-related variables also shared statistically significant relationships to journal article per faculty productivity, but were excluded from the model due to the aforementioned multicollinearity requirements. Of the disciplines groupings studied, the health and life sciences model was the strongest overall model with an adjusted R-squared value of .667. This indicates that 66.7% of the variability in scholarly output in this dataset is explained by the four independent variables in this model.
Social Sciences
The social sciences grouping consisted of a variety of psychology, public policy, and education—of which, some programs were combined with aspects of economics and sociology. The resulting model featured the same four explanatory variables as the health and life sciences grouping, but almost in reverse order in terms of standardized coefficient values. The financial strength of the institution had the strongest relationship with scholarly research productivity by far—with a value more than twice that of the next highest variable (see Figure 2). The remaining variables—number of grants, electronic library material expenditures, and research expenditures—each had positive coefficients, but to a lesser degree than financial strength.
Figure 2. Standardized coefficients of explanatory variables for faculty scholarly productivity in the social sciences.

**SOCIAL SCIENCES**
Standardized Coefficients

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<td>Research Expenditures</td>
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(n=278, p<.05, adj. r-sq=.566)

**Psychology**
While psychology is included among the disciplines in the social science grouping above, a separate analysis was conducted focusing solely on psychology to test if any disparity existed between this specific discipline and the broader grouping. The results proved to be almost identical (see Figure 3). Financial strength was again the most highly related variable to scholarly output by a wide margin, while the number of grants and electronic library materials shared standardized coefficients that were less than half the size of financial strength. The difference between psychology and the wider social sciences grouping was that overall institutional research expenditures proved not to be related to scholarly output in psychology in a statistically significant fashion.
Figure 3.
Standardized coefficients of explanatory variables for faculty scholarly productivity in psychology.

**PSYCHOLOGY**

*Standardized Coefficients*

<table>
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<td>Financial Strength</td>
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(n=168, p<.05, adj. r-sq=.520)

**Engineering**

Scholarship in the field of engineering had the most unique relationship to library variables of the various disciplines studied. Of the library variables, only total library expenditures showed a statistically significant relationship to scholarly output (see Figure 4). The other significant variables were the number of grants and research expenditures. The number of grants awarded to each engineering department had a relationship to scholarly output that was about two and half times stronger than total library expenditures and five and a half times that of overall institutional research expenditures. It should also be noted that the engineering data produced the weakest model, with an adjusted R-squared value of .478.
Figure 4. Standardized coefficients of explanatory variables for faculty scholarly productivity in engineering.

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(n=121, p<.05, adj. r-sq=.478)

Art History
The regression model for art history is constructed differently from the others. No library variables were significantly related to the number of articles published per faculty member when taking the approach used in analyzing the other disciplines. Furthermore, no model could be constructed with any combination of independent variables from the dataset that could explain more than 12.3% of the variance in journal article output from one program to the next.

By switching the dependent variable from journal articles per faculty to the total number of books per art history department, however, a much clearer picture emerged. Print material expenditures were highly related to the rate of monographic publishing for art historians (see Figure 5). In fact, print materials were almost equal in importance to this scholarly productivity as the number of faculty members in a department. It suggests that art historians place more value on the monograph as both a form of scholarly expression and as a research material. Other key variables included the financial strength of the institution and the number of grants received by each art history department.
Figure 5.
Standardized coefficients of explanatory variables for faculty scholarly productivity in art history.

<table>
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<th>ART HISTORY</th>
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<td>Financial Strength</td>
<td>0.221</td>
</tr>
<tr>
<td>Number of Grants</td>
<td>0.161</td>
</tr>
</tbody>
</table>

(n=63, p<.05, adj. r-sq=.503)

**Conclusion**
At first glance, the findings of this analysis seem to both corroborate and refute its predecessors. On the one hand, it reinforces the notion that adequate investment in electronic library materials is one of the most essential support components of faculty scholarly research productivity that a university can provide. On the other, it reveals that maintaining current investment in print materials is likely a key element to supporting productivity in the arts and humanities—or at least as is represented here by art history. This could appear to contradict the finding of the earlier studies, which suggested that spending on print at the expense of electronic materials hinders productivity. Rather than contradict, however, these new findings more realistically serve to provide much-needed context to the original findings. The synthesis of these studies regarding print is that these materials do support productivity in an empirically detectable fashion, but that the agency of print to the sciences is negligible compared to that of electronic materials.

The discussion of print and electronic materials relates to the secondary purpose of this study which, as stated at the beginning of the paper, is to explore how effectively different types of library investments support scholarly productivity across different disciplines. The primary purpose of this effort, on the other hand, is simply to demonstrate that better funded libraries are quantitatively related to scholarly productivity. The analysis here clearly supports that notion. Increased library investment is a predictor of increased scholarly production for a broad spectrum of fields. Taken in consideration alongside the findings of the preceding studies, it seems that this relationship between scholarly output and library inputs manifests itself regardless of how the question is approached. Of course, supporting research is what libraries are designed to do and, perhaps, we
should not be too surprised to find empirical links between the two. But at a time when perceptions concerning the role of the library in academia are fluid and opinions of its current value vary across the campus, the evidence presented here suggests that a well-resourced library is as important as ever—with the further implication being that the institution that does not properly sustain its library creates a measureable impediment to the productivity of its entire research community.

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Endnotes

Making Value Measurement a Reality: Implementing the Value Scorecard

Stephen Town
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The purpose of this presentation is to describe and evaluate the implementation of a value scorecard. The scorecard was developed by the author and others to provide a new conceptual framework for value measurement, and reported in previous Library Assessment and Northumbria conferences. This presentation covers application of the framework to a real library situation.

The presentation describes the rationale, application and experience of working with new measurement concepts arising from the specific articulation of value, and the combination of these new ideas for assessment with pre-existing methods and techniques, including the balanced scorecard. The research approach has been described in previous papers, and generated a four dimensional matrix for assessment of library capital value. This presentation presents the case study of its application at the University of York, reports on practical issues surrounding implementation, and reflects on culture and acceptability across a variety of service units, including archives and specialist IT functions.

The combination and overlap of previous Balanced Scorecard and new Value Scorecard dimensions has resulted in a six-element reporting template, and provides a pragmatic solution for assessment from service unit leader level, without losing the underlying strength and breadth of the analysis. The paper reflects on the overall coherence and coverage of the framework, but concentrates on those areas of measurement that the research programme revealed to be weaker or lacking in other frameworks and datasets. These include: human capital value, relational value, collection capital and impact in the digital environment, and strategic momentum. The difficulties in generating new metrics or qualitative narrative for these elements are discussed. The relationship between the scorecard and institutional KPIs, the Customer Service Excellence award initiative in progress in the library, and other assessment tools (including LibQUAL+ and ClimateQUAL) are evaluated. Links are made to institutional level strategy and the data requirements of director level staff for effective advocacy within and beyond the institution. The report template covers strategic progress as well as “business as usual” services, and provides narrative on cultural and relational positioning absent from other measurement frameworks.

This unique development can provide academic and research libraries with an enhanced framework for performance measurement and the advocacy of success to a library’s broader stakeholders. As such it provides a significant contribution to effective, sustainable and practical assessment, as it can be tailored to local institutional requirements, emphasis and context. It offers the flexibility to incorporate other existing frameworks, standards and cultural assumptions, and provides a method to combine qualitative narrative and quantitative metrics. The inclusion of the momentum dimension provides a focus for driving and enacting positive change. The template has been rolled out for the academic year 2013–14, and a full year of quarterly reports will have been delivered by the time of the paper presentation. It will also be clear by then what impact the Customer Service Excellence programme has had on specific metrics, and how the results of LibQUAL+, TechQUAL and staff surveys have been incorporated across different service units.

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Abstract
Strategic planning involves a wide variety of activities from collecting and analyzing data to finding collaboration activities that advance the strategic plan. While there are several methods that seek to coordinate the strategic planning process, Oakleaf’s library impact map provides a method whereby library services and university foci are mapped to determine the degree of data collection. It also provides insights where collaboration may occur and helps librarians focus on key areas that show promise for strategic planning and to indicate the value of libraries.

This paper discusses the modifications, implementations, and results from the initial implementation of a library impact map at Brigham Young Universities’ Harold B. Lee Library. Implications of the findings for future planning and collaboration are also discussed.

As libraries seek to identify and publish their value to organizations and individuals, a mechanism is needed to provide an overview of library services from both broad and narrow perspectives. In the case of academic libraries, value promotion needs to be tied to the sponsoring institution. The goals and services provided by the library need a direct connection to the foci of the university. First, connecting library services to university foci serves as a method for reporting accountability. This connection enables individuals to determine if the library service is meeting university needs and the degree to which it is meeting those needs.

Second, the initial link between library services and university foci creates a baseline measure of where the library currently is in its delivery of value to the university. Subsequent codings become accountability measures indicating the direction the library has moved to improve its services.

Third, following the development of the baseline measure, the tool may be used for strategic planning. In addition to identifying strong connections (that need to be maintained) and weak connections (that need to be improved), the tool should provide an indication of how each service is best situated to meet the needs of the university foci. The tool may be used to identify which services should be sustained, which need to be further developed, and which need to be downsized or eliminated.

Fourth, the tool becomes a unifying document. Instead of viewing a large academic library as a collection of departments and divisions, it provides a view of where services may be moved, melded, or altered to meet the needs of library patrons. As more library faculty and staff are engaged in the identification and coding process, the tool also serves as a means to identify where and with whom collaborations might occur. These collaborations not only create efficiencies in the delivery of services, they also promote a greater understanding of library services and of the connection those services have to other university entities. This process helps identify lead and lag measures that provide evidence of the library service’s importance and promotes buy-in for the library service delivery.

While there are several tools and heuristics available that accomplish some or part of these goals, a library impact map (LIM) meets each of these needs in a concise document that connects library importance and impact to university foci and needs. The LIM, initially developed by Oakleaf (2012), provides a clear connection between library services and university foci that engages a broad perspective of library personnel in its creation and use. The purpose of this article is to describe how baseline measures were collected, describe modifications made to the LIM, provide an initial analysis of those measures and outline
some of the benefits of using a LIM in a library’s strategic planning.

Collection of Baseline Codings
Using the LIM from Oakleaf’s “Academic Library Value: The Impact Starter Kit,” the Harold B. Lee Library (HBLL) assessment librarian and an assistant university librarian adapted the categories of university foci and library services to fit the unique circumstances of the HBLL at Brigham Young University (BYU). A total of 46 library services and 29 institutional foci were identified as relevant to BYU. The university foci were located in the heading of each row and the library services were located in the heading of each column. The resulting grid indicated an intersection between each university focus and each library service. A partial sample of this grid is shown in Figure 1.

Figure 1. A partial library impact map with codings between library services and university foci.

<table>
<thead>
<tr>
<th>Library Impact Map</th>
<th>Reference, Physical</th>
<th>Reference, Digital</th>
<th>Reference, Subject Guides</th>
<th>Reference, Embedded Guides</th>
<th>Reference, Consultations</th>
<th>Liaison Services</th>
<th>Embedded/Mobile Services</th>
<th>Institutional Repositories</th>
<th>Data Repositories</th>
<th>Instruction, One-Shot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Teaching</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>CB</td>
<td>CB</td>
<td>Y</td>
</tr>
<tr>
<td>Faculty Innovation, Entrepreneurship</td>
<td>CB</td>
<td>CB</td>
<td>CB</td>
<td>CB</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>CB</td>
<td>CB</td>
<td>Y</td>
</tr>
<tr>
<td>Institutional Brand</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>CB</td>
<td>CB</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Institutional Development, Funding, Endowments</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>CB</td>
<td>CB</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Faculty Research Productivity</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>CB</td>
<td>CB</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Local, Global Engagement, Community-Building, Social Inclusion</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>CB</td>
<td>CB</td>
<td>Y</td>
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</tr>
<tr>
<td>Character Building</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>CB</td>
<td>CB</td>
<td>CB</td>
<td>N</td>
</tr>
<tr>
<td>Student-Faculty Academic Report</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>CB</td>
<td>CB</td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

Y+ = impact with evidence/data, Y = belief of impact, CB = could be impact if something was done or data was collected differently, and N = no impact.

After identifying university foci and library services, a team of 15 faculty and staff with requisite expertise in specific areas were identified and asked to participate in the assessment. Each expert received an overview of the project, was assigned specific library services within their area of expertise, and was asked to place one of five codes in the intersection of each university focus and library service. The codes included the following: impact with evidence/data & communicated (Y++), impact with evidence/data (Y+), belief of impact (Y), could be impact if something was done or data was collected differently (CB), and no impact (N).

Following the amalgamation of codings onto a single map, each coding was summed by university focus and by library service. As a final step, each coding was given a unique color to help librarians better examine the pattern of codings between each library service and university focus.

Modification Made to the LIM
Shortly after the codings were collected, the library administration developed three goals for library services to meet the needs of university foci. The university foci were aligned so that each focus
would fit within one of the three HBLL goals. The goals include the following:

1. Improving discoverability of and access to resources—especially those unique to BYU—in order to support scholarship and to maximize our investment in acquiring and preserving this material.

2. Providing spaces that facilitate collaboration, experimentation, creation, and discovery.

3. Fostering deep collaboration that produces new knowledge (research) and facilitates learning.

Two additional layers were added to library services. Each service was placed within the department responsible for the service. Each department and each service were then located within the library division. These additional layers allowed researchers to examine the delivery of services to meet university needs by library goals, library department, and library division in addition to being able to disaggregate codings by each focus and service. Figure 2 shows a partial LIM with these additional layers.

**Limitations**

Prior to discussing the findings from this initial attempt to map library impact, several considerations should be discussed. First, a single person completed each initial coding for a given intersection between each university focus and library service. While each expert has considerable proficiency for the assigned area, the stated coding is a reflection of only one person’s experience and understanding. Additional information from others may add to these ratings by supporting or altering the initial ratings.
A second consideration is the fluid nature of library services and foci. For example, two services, roving reference and an instruction credit course, were discontinued because they presently do not exist in the library. Also, library personnel responsibilities shift, depending on assigned duties. As a result, the LIM and findings are considered a first overall look at the impact of library services.

A third consideration is the coding between library services and institutional foci. There are some library services that do not and will not have a relationship with some institutional foci. As a result, the indication of a no impact coding may only reflect this reality.
Fourth, the coding is subject to each expert’s understanding of the library services and university foci. While efforts were made to clarify terms, each expert’s understanding of a specific focus or a specific service may result in a different coding. A different expert may render a different coding.

Finally, each institution must set its own threshold level to indicate the benchmark it wishes to achieve. That is, how many or what percent of institutional foci should each service or department meet? Conversely, how many services are required to meet the needs of each institutional focus?

Findings
The LIM coding presents opportunities to better understand the library’s value and to plan for better service delivery. This article focuses on specific codings that illustrate how analyses may be completed by using the initial codings from BYU. However, the LIM from another university may focus on different codings (e.g., CB results instead of Y results), services, or foci. Regardless, once created, a LIM should be revisited periodically as changes in one’s understanding may present new insights on how the library is collecting and disseminating data indicating its value.

University Foci
Using the coding of “yes there is belief of impact,” the LIM indicated six university foci that had a majority of Y codings. Five of these six Y codings centered on student actions (i.e., Student GPA, Test Achievement, Student Learning Outcomes, Undergraduate Research and Student Experience/Engagement). This result indicates belief of impact in a key area of patron support, but more data needs to be collected and disseminated. Additional planning could improve the provision of services aiding in these foci.

Two foci received mostly “no impact” codings (i.e., Local/Global Economic Growth and Institutional Athletics). A secondary examination centers on which services provided specific codings. For example, in examining the institutional athletics, all collections, acquisitions, and cataloging indicated there was minimal impact in this university focus of institutional athletics. This provides an example where a re-examination of this focus may provide additional information to determine if the “no impact” coding is accurate or if it indicates that nothing has been collected, acquired, or cataloged relating to any institutional athletics. If “no impact” is the correct coding, this coding serves as a discussion point for librarians involved in this area to determine what could be done so that the library has a greater impact in this area.

Library Goals
When university foci are grouped by library goals, several patterns emerge. First, four percent or less of codings indicate that data was collected and/or disseminated. This highlights that more lead and lag measures of library impact need to be identified, have data collected, and be disseminated to describe library impact.

Second, “yes” and “could be” codings account for between 55% and 60% of each library goal. These codings emphasize both that librarians need to identify and collect data to verify the degree of impact library services have on library goals and that something different needs to be done. The specifics of what needs to be done rests with those associated with the specific department. This information then assists strategic planning for library services and actions.

Finally, between 33% and 40% of services in each goal group indicate “no impact” on that goal. This result calls for a re-examination of codings to determine if there could be an impact or if data is, in fact, being collected. Involvement of other librarians would help to clarify if these codings are correct and to plan for how an impact may be determined.

Library Service
Seven library services have similar response rates of between 75% and 93% for each given coding. Collection development, general collections, and special topics collections reported this high level of coding for the “could be” category. In this case, the librarians associated with collections should identify what could be done differently or what data could be collected to indicate an impact.

Special collections and archives had the most successful indications of impact with over one-third of each service indicating that data had been collected and most data disseminated to indicate impact. Each service indicates the strong opportunity for impact but with no data collection. In this case, the library service has strong potential
for impact identified either with or without data collected. The planning would focus on maintaining and improving these levels of impact support.

Finally, disability services and friends of the library indicate high levels of “no impact” codings (93% and 83% respectively). For these services, a secondary examination of the service would be conducted by checking the impact for each university focus. While it may be the case that these services only impact a few key foci, there may be potential impact elsewhere.

Library Department and Division
Analysis of codings for library departments and divisions on the LIM is conducted in a similar manner as library goals were conducted. Overall trends and patterns for each department and division indicate the degree of impact from that specific division. For example, the Special Collections division indicates a strong impact, much of which has collected data and disseminated findings. Discussions in this division would focus on the types of data collection that could be collected and the best way to disseminate that data.

While specific services may be coded in one way, a department or division view may find that a specific service may be typical or vastly different from the entire department or division. For example, within the Collections and Technical Services department, the acquisitions and cataloging services are anomalies. Each service shows a one-third/two-thirds split regarding whether there is or is not an impact from the specific service. This differs from the rest of the division’s services, in which a “could be” rating is dominant.

Collaborations
Discussions could also focus on what could be done differently within each department or division. These discussions may add layers to the LIM, such as the use of personas or user groups to better define the type of patron being served. Discussions may examine collaboration opportunities with other library departments and divisions or entities outside of the library. These collaborations would not only help define the value of the library but would help build a stronger understanding between the collaborators. This would only build connections of value and trust.

Potential collaborations within the library begin by identifying a specific university focus and examining which library services currently meet that need or could potentially meet the need. As librarians discuss meeting the need of the university focus, librarians may discover duplicated services, parallel services, and opportunities for collaboration. In examining duplicated services, librarians could adjust and realign services so the library functions in a more cost-effective and efficient manner. Parallel services indicate areas where collected data or service delivery accomplishes two unique tasks. In simple terms, this would be akin to two people seeking to use an orange, one for the peel for baking and the other to use the flesh to make juice. In this example, two separate services or departments may use the same set of data, allowing for collaboration on data collection and use. Regardless of the type of collaboration, greater value may be achieved in examining how things are done and where collaborations may occur.

Conclusion
The LIM suggests several opportunities for indicating library value. It offers librarians the opportunity to identify where key conversations may occur or need to occur to improve library service. Within these conversations, librarians are able to better identify what type of data can and should be collected to indicate library impact. Collaboration opportunities within the library may also be identified. As future LIM studies are conducted, librarians will be able to determine the direction of library impact on the institution and patrons it serves.

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4. Ibid.


Affecting Change through ClimateQUAL®: Experiences of Phase 1 and 2 Participants

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Abstract
This paper reports on the results of semi-structured interviews conducted with library directors and senior administrators of institutions that participated in the first two phases (2007/2008) of the ClimateQUAL Organizational Climate and Diversity Assessment. The study explores the reasons that library directors decide to have their organizations undertake the assessment, whether and in what areas libraries use the survey results to implement changes within the organization, and how they monitor such changes to improve the health of the organization.

The results of this study are of value to those wanting to improve organizational climate. As ARL continues to promote this assessment protocol, this study will be of interest to library directors and ARL administrators who wish to know more about the use of the assessment tool in research libraries. It may also assist ARL in making further improvements to the survey and the associated processes through which libraries participate.

Introduction
Originally developed in 1999 as a joint initiative between the university libraries and the industrial and organizational psychology department at the University of Maryland, the ClimateQUAL Organizational Climate and Diversity Assessment (hereafter called ClimateQUAL) is a method of data collection that some university research libraries use to gain greater clarity on their organizational climate as filtered through the perceptions of their employees. The method, which has evolved over time, measures organizational climates for diversity, teamwork, learning, fairness, managerial practices, and individual beliefs within the organization. More specifically, it incorporates elements of workforce diversity, organizational climate, and organizational culture to build the concept of the “healthy organization,” defined as an organization that can “manage and empower its diverse human resources to enable the organization to achieve its goals.”

Administered as a series of surveys conducted online using SurveyMonkey.com over a period of three weeks, ClimateQUAL is managed by the Association of Research Libraries (ARL). The survey currently consists of 150 questions representing nine climate dimensions (justice, leadership, deep diversity, demographic diversity, innovation, continual learning, teamwork, customer service, and psychological safety) and seven organizational attitude scales (job satisfaction, organizational commitment, organizational citizenship behaviors, organizational withdrawal, team psychological empowerment in the workplace, task engagement, and work unit conflict). There are also additional demographic questions and a box for free text comments at the end of the survey.

While ARL staff members and various librarians have provided conference presentations on the findings of ClimateQUAL assessments at specific institutions, and there are a few internal reports of actions taken based on the results, no study has formally explored the reasons that library directors decide to have their organizations undertake the assessment, whether and in what areas libraries use the survey results to implement changes within the organization, and how they monitor such changes to improve the health of the organization. The results of this study are of value to those wanting to improve organizational climate. As ARL continues to promote this assessment protocol, this study will be of interest to library directors and ARL administrators who wish to know more about the use of the assessment tool in research libraries. It may also assist ARL in making further improvements to the survey and the associated processes through which libraries participate.
Literature Review

While a growing body of literature in library and information science focuses on the creation and use of ClimateQUAL, many of these accounts are promotional or introductory, and they are written by those involved in developing or administering the survey. For example, Kyrillidou and Baughman provide a brief history on the development of the survey. In a few instances, participating organizations have also issued internal reports, or staff at those organizations have given conference presentations on their experience with ClimateQUAL, highlighting specific results within their institutions. Li and Bryan detailed Cornell University Library’s experience with the assessment and the steps taken as a result of the survey. More recently, Andrade and Rivera discussed the use of ClimateQUAL as part of broader strategy for developing a diversity competent workforce at the University of Arizona.

Procedures

Between 2007 and 2008, 15 institutions participated in the first two phases of the ClimateQUAL survey implementation. These institutions, geographically dispersed throughout the United States, represented a mix of both private and land-grant universities, and they served as the study population, as they were presumed to have had the most time to have developed strategic planning initiatives based on the findings, to have implemented changes based on the findings, and to make the organization healthier.

During fall 2012, the library directors at the institutions were contacted about participating in the study via e-mail with a message introducing the investigator and explaining the nature of the research. As part of this message, each director was asked to participate in a telephone interview. Once a director agreed to participate, a time to conduct the telephone interview was arranged. As nearly five years had passed for most of the libraries in the study, a copy of the interview protocol was sent in advance of the interview to allow respondents time to re-familiarize themselves with their ClimateQUAL study or to identify a surrogate in the organization who had a greater recollection of the assessment. In some cases, library directors recommended the investigator conduct the interview with a different member of the organization. In these cases, the designee was contacted by e-mail and the informed consent form was sent to this person.

Results

Ten directors consented to have their institutions participate in the study for a response rate of 66.7 percent. Six directors agreed to be interviewed themselves, either alone or with an associate director, and remaining directors designated either an associate director or a human resources director to participate in the interview as their representative. Another two declined to participate mentioning negative experiences with the ClimateQUAL survey.

Reasons for undertaking the ClimateQUAL assessment

There were a variety of different reasons for undertaking the survey. Four participants mentioned the arrival of a new director who was interested in gaining a better understanding of the organizational climate, and two participants specifically mentioned that ClimateQUAL fit into an existing strategic plan or organizational goals. Multiple respondents stated the ability to draw comparisons with peer institutions was a deciding factor. Several respondents indicated that their organizations had been engaging in previous climate and diversity assessments and were eager to experiment with ClimateQUAL due to its targeted focus on libraries. As one respondent noted, “We had been aggressively working for 17 years plus on trying to improve our climate for diversity, 14–15 years trying to develop a team based organization with a climate that would help us do better in library service and in maintaining high quality people.” A phase II respondent remarked that the library had been following the progress of institutions that participated in the first phase of ClimateQUAL, and they were impressed by the reported link between organizational climate and customer satisfaction.

Maintaining organizational health

When asked whether the survey indicated that their organizations were healthy or whether areas were identified for improvement, most respondents said that both were the case. Eight of them reported that the organization was either healthy or as healthy as those institutions taking the survey in the same phase. As noted by one respondent, “We were within the norm of libraries that had taken
survey. We identified things that were relatively problematic—it did not reveal that we were in terrible trouble.”

Each respondent was also asked about how his or her organization had maintained its reported health after receiving its results. While most of the institutions in the study reported that they had not done anything, in particular, to maintain their organizational health, three institutions provided specific examples of their efforts to do so. One respondent commented that the library’s diversity committee had helped to look at the results and suggest a framework based on emotional intelligence for staff training and development. To maintain organizational health, the library created a number of workshops in areas related to trust, respect, communication skills, decision making, team building, and people from diverse backgrounds. This organization also developed targeted programming for specific departments where “it was clear that there were some issues and specific interventions that were needed particularly related to supervision.”

Another respondent commented on organizational diversity as a strength that surfaced in the results. This person noted the possibility that this strength was due, in part, to the institution’s urban geographic location. Further, this person continued, diversity “was not necessarily sustained without any effort” and was not to be taken for granted. Another area highlighted by the study related to supervisors having a positive impact on relationships with staff and a strong commitment to providing high quality services to library users. Additionally, this respondent explained that, prior to the survey, the library had completed a strategic plan in which service, leadership, and improving the organizational climate had been targeted as areas of focus. The ClimateQUAL results helped to provide the library with additional data to support its strategic planning efforts.

Another respondent explained that, after receiving the results, they worked with a campus unit outside of the library to conduct focus group interviews in a “decision-lab,” a campus computing space where staff of all levels could further discuss the results and record comments anonymously. As noted, “We did that to try to pull back some of these things to see if we could get to a root cause.” This resulted in the creation of a “very rigorous dialogue brown bag training program on things like micro-aggression and various diverse topics—just to keep the emphasis up—though we were fairly healthy—we just wanted to keep the environment healthy.”

Interpreting results and generating recommendations for improvements
Each respondent in the study identified areas for improvement and most implemented a process for addressing them. Each participant, however, reported a slightly different approach to prioritizing the areas in which the library would focus. Three explicitly mentioned using consultants or facilitators from outside of the library to aid in the analysis and interpretation of the results. One used a consultant to interpret the results, which ultimately shifted the focus to a broader need for support on organizational development within the institution. The respondent explained that the consultant “looked at any of the climate factors where there was less than 50 percent agreement, and where there was a wide variance from peer institutions, and then if she saw that there were differences in responses from one demographic group in the library to another, she would look at that. Those were the things that she did to figure out what we should work on.” This led to a determination that establishing an organizational development strategy for the library would generally help to address issues related to the various climates identified in the study. The consultant recommended that the institution focus on three particular areas: leadership, performance management, and the hiring and promotions system. As a result, three tasks forces were formed to address and create further recommendations in each of those areas.

Another respondent described the organization’s process in reviewing the results and identifying the areas with biggest areas of variation and determining how to prioritize the items to be addressed first. The library used a consultant to help with interpreting and translating the results into plain language that could be more easily understood by employees, and provided a narrative summary along with edited comments to library staff. After organizing discussion sessions to review the results, the consultant held a series of open focus group interviews to discuss the top ten areas of concern highlighted by the survey. Through this process the library identified three primary climate areas on which to focus: distributive justice,
procedural justice, and structural facilitation of teamwork. Senior library administration subsequently convened a task force of volunteers, which included the library director and the head of personnel to develop ideas for how to address top priority areas. The result was a report, which recommended 16 action items in a variety of areas ranging from organizational policies, to events, to staff development training.

Another institution hired a consultant from within the university to conduct follow up focus group interviews and individual interviews with library staff. This work led to recommendations in two specific areas for the institution: organizational justice and innovation. As a result, the consultant helped to establish two task force groups, one for each area, which subsequently developed a report outlining strategies for action in addressing those two concerns. The task force on organizational justice found that staff perceptions were closely tied to the perception of their supervisor, that there were not enough non-monetary rewards in the organization, and that staff found it difficult to locate information about the organization. The task force on innovation recommended that library administration educate staff on the library’s strategic plan, specifically how to incorporate new ideas into the plan, as well as develop a workshop or lecture series to educate staff on how to implement those ideas.

Other libraries reported that identifying strategies for action based on the results was dispersed throughout the organization and assorted committees and departments. One respondent described that, after review by the management team, the results were shared with the entire staff with the request that various groups identify areas of concern that they could work to address. In this particular library multiple departments and teams formed their own lists of recommendations for changes that could be implemented to improve the overall climate of the organization. Additionally, a learning and development committee produced a comprehensive list of themes from their review and recommended the formation of two working groups, one focused on rewards and recognition and the other on cross-functional teamwork.

At one library the senior management team and an existing diversity committee reviewed and interpreted the results, which led to a decision to focus on organizational climates of interpersonal treatment, demographic diversity, psychological safety, and continual learning. Their recommendations were to establish a library-wide staff training program addressing issues related to developing trust, respect, communication, decision making, team building, and diversity, which was also a focus of the university at the time.

Another library convened a meeting with the senior management team, dedicated to discussing the results of ClimateQUAL. Rather than generating a list of recommendations for change, the outcome of this meeting was a decision for the organization to focus on improving its climate for informational justice, which refers to whether employees feel they have access to the information they need. As a result, the senior management team established an internal communications task force to review communications in the library as means of addressing this issue.

Implementing change
All but one of the respondents reported implementing changes derived from the results of ClimateQUAL. The one library reported that no changes had been made due to the arrival of a new dean, who shifted focus for the organization. While the other libraries in the study implemented
changes, many respondents noted that these changes were still in process nearly five years after completing the survey, and others added that they had not been able to address all of the recommendations in the time period following the receipt of their results.

Overall, the specific changes made at each library varied, but a number of common themes surfaced in the study. Most of the changes fell into six different categories: (1) administrative and internal communication, (2) equity between librarians and library staff, (3) staff training and development, (4) performance evaluations and employee advancement, (5) recruitment and orientation processes, and (6) rewards and recognition.

**Administrative and internal communication**

Many of the respondents saw internal communication as one area of change. One library used the recommendations to focus on improving organizational communication by implementing an anonymous online feedback mechanism. Additionally, the director sought to go beyond the standard open door policy, by setting up office hours at an offsite location and making arrangements to meet with each library department in order to understand its concerns better. This library is also reviewing the use and management of the intranet and looking at how documents and e-mail messages are exchanged and shared across the organization.

Two respondents discussed the creation of a weekly e-mail message to staff from the library director in order to update all staff on happenings and current activities. One also mentioned developing a separate human resources update delivered to staff either monthly or biweekly. Another respondent described efforts to improve communications in meetings, including norm setting practices and drafting guidelines on effective team charges and meeting agendas.

**Equity in rank between librarians and library staff**

Following the analysis of their ClimateQUAL results some libraries reexamined the divisions between librarian and non-librarian staff and implemented changes to address this relationship. One respondent described the work to restructure two internal governance organizations whose membership had previously been exclusive to professional librarians. One of these was merged with another library-wide team that included non-librarian members to make it more accessible to staff. This library also disbanded the council of librarians to create a “managers council” that combines managers from across the library system regardless of rank or librarian status. In response to a recommendation for de-emphasizing rank and creating an expectation for collegiality, one library modified its approach to orienting new staff in order to incorporate this message. Another library discussed efforts to adjust the makeup of library teams to utilize a wider variety of staff and a greater diversity of rank. In commenting on this transition, the respondent stated that,

There is now a care and attention to how we put together teams that need to work together. Whereas before maybe there was a dominance to put faculty members or a certain number or administrators on, there have now been initiatives that have been led by lower level administrators sometimes, by staff members, by bargaining union members.

**Staff training and development**

Training and development was another key area of change for most of the libraries in the study. One organization used the results to establish a series of workshops organized by the director of human resources and the diversity committee. Workshops in the series covered topics such as emotional intelligence and working with international student populations. Another library used recommendations derived from ClimateQUAL and the strategic plan to develop a staff training curriculum around issues of management, conflict resolution, and team building strategies. Two respondents specifically mentioned the creation of library-wide diversity training initiatives, one of which included the development of a set of diversity competencies for the library staff.

Some of the staff training opportunities respondents discussed developing were specifically targeted to those in administrative or supervisory roles within the organization. One described the management team’s work to develop a management training program for supervisors, and another established regular training sessions for the library leadership council in areas related to communication, facilitation, project management,
team building, and managerial skills. One respondent also mentioned that the library was currently working on a strategic plan for training that would span everyone in the library.

**Performance evaluation and employee advancement**

In addressing library staff concerns regarding the consistency of performance evaluations, many of the respondents discussed making improvements to the categories and definitions used by the organization to describe performance. Additionally, some implemented new processes for setting performance goals and conducting evaluations. Other respondents mentioned their efforts to develop training in support of the performance evaluation process, including regular sessions for staff on how to best prepare self-evaluations to get appropriate credit for activities. One respondent also described the library administration’s work in implementing a new management training curriculum focusing on the performance evaluation process for supervisors. Additionally, two respondents mentioned the creation of a career ladder for non-librarian rank employees.

**Recruitment and orientation processes**

Four respondents discussed implementing changes related to orienting and preparing new employees for success in the organization. These changes ranged from the actual creation of an orientation program to the development of an orientation checklist for new employees. One library assigned a mentor to all new hires in order to help with their transition. Other respondents discussed changes to the hiring process, including the procedures for forming search committees and efforts to increase the diversity of candidate pools, whenever possible.

**Rewards and recognition**

Many of the respondents described efforts to improve organizational systems for recognizing the work of staff. Changes ranged from recognizing employees at general staff meetings to establishing new reward programs for the library. One respondent emphasized the efforts to foster a culture of recognition through the creation of a rewards and recognition committee.

**Monitoring changes for improvements**

While most of the libraries had not developed formal systems for monitoring the effectiveness of the changes they were making, some provided examples of their efforts to do so. One respondent described the library’s efforts to experiment with the membership of the managers’ council. The managers’ council had previously included the university librarian, associate university librarians (AULs), and other executive group managers from across the organization. After doing a self-evaluation, the AULs were removed from the council, leaving the university librarian and the assistant to the university librarian as the only remaining members from the senior management team. The library is continuing to evaluate the managers’ council to ensure that the new configuration is working out, and it conducted a “year-in-review” evaluation with the membership this past spring. The respondent also explained that surveys and self-evaluations have been used to collect feedback from the council and that the survey responses are sent to an administrative assistant, rather than to the university librarian, for analysis.

Another respondent commented on the formation of a rewards and recognition team, stating that recommendations for recognition are “distributed openly to departmental managers—so every three months, we know how many nominations we’re getting.” This respondent continued by noting that this team recently conducted a survey to get feedback on whether it should add a new recognition or reward program for staff, retire an existing award, or make other changes in how the team conducts its work.

Other respondents in the study supplied a variety of anecdotal methods for identifying the success of changes implemented in response to ClimateQUAL. One highlighted a performance review training program indicating its positive impact. The library’s collective review team, which oversees annual staff performance evaluations, has been working to ensure that supervisors use consistent terminology when describing employee performance. As a result of the performance review training program, this respondent explained that “there have been fewer changes that have had to be made to supervisory assessments. The definition and criteria are being applied more consistently.” Commenting on the library director’s efforts to hold official office hours, another respondent stated that “she doesn’t have a lot of staff come through, but if you talk to staff individually she is revered, and they know that she is making the effort.” Yet another respondent from an institution that focused on the creation of a staff
development program stated that “we haven’t done anything—well, we do post workshop evaluations, but nothing that has really assessed whether change has happened.”

Improving organizational health through change
While nearly all the institutions in this study had implemented changes, the changes varied as to whether they had improved the health of the organization. Additionally, some libraries monitored changes in order to understand what impact they were having. Most respondents indicated that the health of their organizations had improved since the time of their participation in phase one or two of ClimateQUAL, but few felt they could directly attribute those improvements to their work to implement change through ClimateQUAL alone. One stated the perception that better communication and employee interactions were occurring and that there was less conflict among personnel. This respondent also thought that employees’ communication skills had improved and that staff in supervisory roles were better equipped to handle concerns at their level before they became larger issues. However, this respondent also noted that the organization had undergone a significant reorganization since the time the library had participated in ClimateQUAL, adding, “It’s hard to figure out what all has contributed to making it a healthier organization, but I think we are one.”

Others also acknowledged the amount of change the library had been through since undertaking ClimateQUAL. As one respondent noted,

Since we did ClimateQUAL, our library has changed so much in terms of its personality, we’ve gone through a huge amount of change and it’s been a cultural change as well... new administration, new strategic plan with new directions, just library things that are going on, move to digital materials, we had a lot of retirements, and a lot of new hires, all of those go into shaping the culture of the library.

Yet another respondent discussed an unanticipated permanent reduction in the number of associate directors (ADs) on the administrative team that occurred during the period following the ClimateQUAL assessment. This transition required middle managers to become more involved in the day-to-day governance of the library. In reflecting on the administration’s response, this respondent stated, “We emphasized that department heads would need to be more proactive in their leadership roles. That they were not going to have an AD to hide behind, and that has also had some impact on the organization, in terms of the managers feeling more empowered.” Further, this respondent expressed that going through the process of ClimateQUAL had perhaps prepared staff to cope better with the changes they were experiencing, commenting that “it gave structure and language to talk about these things. We had staff training on stability in workplace and people talked about how it had come up in ClimateQUAL.” Others also noted a more indirect value of ClimateQUAL to the organization. To this end, one respondent commented that “what ClimateQUAL did was to focus on more general things that you want in your environment. What we were trying to achieve was better organization between program areas and teams. ClimateQUAL gave us a different perspective because it was measuring different things.”

Another respondent emphasized that their goal in undertaking the survey was that a healthy climate makes a better service for users. This respondent noted that,

We wanted to understand what we needed to do to make it the kind of environment to allow the staff to provide the best level of service. That was pretty clear, they wanted to be treated objectively, they wanted management to be transparent, they wanted more feedback regarding evaluation, they wanted to know why merit was being rewarded, they wanted managers to have management training, and these things came through.

Reuse of ClimateQUAL
Four of the libraries in this study reported that they had conducted ClimateQUAL more than once at the time of the interview. Of those libraries, three had participated in the 2012 phase of ClimateQUAL; each of these directors noted improvements in the areas they had focused on since the previous iteration. Additionally, three other respondents expressed intentions to have their libraries participate in a subsequent round of ClimateQUAL as a method of evaluating their progress. Of
the remaining three respondents interviewed, one explained that they were unlikely to do ClimateQUAL again because of the time and staff investment in analyzing the data, putting teams together, and following up on recommendations. In the words of one director,

There are a lot of changes happening in libraries and we are more inclined in the last 4–5 years to put our energies into updating services or using technology in different ways. I am talking in general terms. Rather than take 10–12 staff and put them on teams that look at the internal operations of the library, we’d rather have them look at digital repositories, data management, and those sorts of initiatives.

Discussion
One theme that the participants mentioned was the excitement about the creation of a new data collection process and the positive responses of early adopters. Even directors whose organizations had taken other climate assessments found the ability to compare results between participating libraries, to be a compelling reason to participate in ClimateQUAL. While this factor would seem to be one of the clear strengths of ClimateQUAL, it is notable that most respondents indicated that the results for their organizations were similar to those of the other participating institutions. A common internally focused theme, particularly among directors who were newer to their institutions, was a desire to acquire a baseline of their organizational climate.

While most respondents indicated that results do not definitively depict whether an organization is healthy or not, they provided them with potential areas in which improvements could be made in their organizational climates. In this regard, most of the organizations in this study utilized the results to make changes in order to improve the health of their organizations. Many of these libraries had no formal method for assessing the impact of the changes they implemented. Additionally, even those institutions that were monitoring their implemented changes had a difficult time attributing improved health to those changes. Several directors spoke about the impact of a variety of broader internal and external pressures, including staff turnover, the economic recession, technological developments, and changes in the higher education that may also have influenced the organizational climate.

Some respondents also discussed a few of the challenges with both the ClimateQUAL instrument and the nature of the reported results. Some expressed concerns about a lack of employee anonymity in the results and possibility of identifying individual staff member responses. Additionally, some commented on the cumbersome nature of the reported survey results and the difficulty in interpreting them. As one respondent stated, “Again with the results when we got them I think one of the weaknesses in ClimateQUAL is that there wasn’t a lot of assistance in understanding what the results meant and so we spent a lot of time figuring out well does this even mean anything, for example.” Another library director commented that “[ClimateQUAL] is a great thing to jump into, but it is difficult, they will not show you the questions in advance and it is very long. Then you get flooded with data, and it is difficult statistically to understand, and it is difficult emotionally to look at. Just choosing where to follow up first takes quite a bit of time.”

As previously alluded to, a related challenge was the investment of staff and time it took to analyze the results and implement change. Many of the respondents expressed both the importance of staff involvement and the formation of teams, and the frustration with the length of time it takes to carry out this process. “We had a complete turnover in the personnel department over the length of time it takes to do everything,” one respondent stated. Most respondents indicated that their libraries’ work on implementing change was still in process four years after the receipt of their results, with one particular director adding that “you can’t focus on everything. Some of the things we addressed got very detailed, which meant we couldn’t do all of them, others did not require much work, and others did not become a focus.” A number of respondents discussed the importance of acting on the results, particularly after the staff has invested so much time into the survey and process of analysis.

Another common theme that surfaced was the use of the employees themselves as a force for implementing change. The respondents described processes for implementing changes that required staff to participate on task forces and work across
divisions in the organization. This, in turn, may have served to generate buy-in from employees and to ensure that not only were their voices being heard, but that they themselves were responsible for improving the health of the organization. For some of the libraries in the study, the process of working with the ClimateQUAL results and implementing change provided an opportunity for staff engagement, which itself had a positive impact on the organization. In reflecting on this experience, one director who used ClimateQUAL for a second time commented,

One thing that surprised me since both surveys, the extent to which people refer to ClimateQUAL, I think even when you talk about staff changes, the process of putting together this group of staff who were using information and sharing, the whole process was part of how we were moving forward, they were doing and being the type of organization that we were trying to move toward.

Conclusion
As a tool for assessing the organizational climate of libraries, ClimateQUAL continues to be a popular method that library directors employ to understand better how employees perceive their organization’s policies, procedures, and practices. As more libraries consider the opportunities ClimateQUAL presents, the experiences and perspectives shared by the administrators in this study may help to inform and guide their decision making. Still, libraries should link such a data collection process to a planning process while looking for long-term improvement in the organization. The administrators in this study saw value in examining the organizational climates, cultures, and diversity of their libraries, and together these elements are markers of organizational health. The concept of the healthy organization challenges libraries to seek out opportunities to make improvements to their organizational climate as a path to improving customer service. Healthy organizations proactively implement policies, practices, and procedures, which demonstrate the value they place on employees and their development. By focusing on elements of fairness, diversity, continual learning, innovation, teamwork, and leadership, libraries not only invest in the quality of service their customers receive, but in their own effectiveness in obtaining organizational goals.

Notes
2. Ibid.
6. Some respondents pointed out that these issues have been resolved in later versions of the ClimateQUAL survey.
7. At the time of the research, approximately 46 institutions had gone through the ClimateQUAL process, some more than once.

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The Engaged Librarian: Crafting an Effective Assessment Plan to Determine the Impact of a Key Strategic Library Initiative

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Purpose
Several models exist for successful library assessment planning. At the Ohio State University, the libraries’ 2011–2016 Strategic Plan serves as an overall framework to guide assessment activities.¹ To better demonstrate the libraries’ contribution to advancing student and faculty success, delivering distinctive content, and fostering intellectual connections, efforts are underway to create assessment and corresponding data gathering plans for select focus areas identified in the plan.

Using this approach, the libraries will be better positioned to communicate the impact of its services and programming on individual constituencies. Specifically, did the service or program achieve its intended results, and if so, how? Did the library make a difference in individual lives?

Research Design: This paper focuses on the development of an assessment and data-gathering plan for the libraries’ first strategic focus area: “Advance transformative teaching and learning by engaging with OSU faculty and support units to integrate library resources and services throughout the educational continuum.” Specifically, it outlines a participatory, organizational approach for developing logic models and corresponding assessment and data-gathering plans to determine the immediate, medium-term, and long-term impact of programmatic initiatives and services. Questions examining whether an initiative or service forwarded the libraries’ mission to “foster an environment conducive to...lifelong learning” are explored, in addition to whether the library helped “students become information literate and globally aware.” Most importantly, the assessment and data-gathering plans for this strategic focus area will identify how the libraries’ contributed “to the University’s drive to eminence in teaching, research, and service.”

Practical Implications/Value: The diversity of constituencies served by The Ohio State University libraries and the complexity of the libraries’ organization makes the development of a singular, relevant assessment plan that captures and communicates the impact of the libraries on advancing student and faculty success particularly difficult. This paper offers an alternative, multifaceted approach to library assessment, which addresses the need for a flexible, yet structured approach for planning and managing library assessment activities.

Introduction
The Ohio State University Libraries adopted A Framework for the Engaged Librarian in the fall of 2012, after recognizing a need for deeper, sustained involvement within the academic community.² This framework was intended to clarify expectations for OSU subject, area studies, and special collections librarians around engagement, to identify competencies required for engagement, and to assist librarians with formulating annual goals. The libraries also anchored engagement within several strategic focus areas for its 2011–2016 Strategic Plan, in effort to support the university’s drive to eminence in teaching, research, and service.³ Defined as “a deepened level of sustained, high-quality, mutually beneficial interaction in the liaison role with academic programs,” engagement is now the central focus of OSU librarians who regularly interact with faculty, and guides teaching, research, collection development, and scholarly communication services.⁴

This paper presents the assessment and data-gathering plan designed to evaluate the programmatic components of focus area 1 of the libraries’ 2011–2016 Strategic Plan: “Advance transformative teaching and learning by engaging with OSU faculty and support units to integrate library resources and services throughout the
educational continuum.” It introduces the need for a modular approach to library assessment planning and outlines a participatory approach for developing a logic model and corresponding assessment plan with input from stakeholders throughout the organization. It also illustrates how to ground and interlace library assessment planning into existing university initiatives in effort to identify the libraries’ contribution to the university’s rise to eminence in teaching, research, and service.

Background
The OSU Libraries developed its existing strategic plan under guidance of the university’s Office of Academic Affairs (OAA) in 2012. The plan follows the OAA suggested template for office and support units, and outlines the libraries’ ten strategic focus areas in relation to the university’s four goals: teaching and learning, research and innovation, outreach and engagement, and resource stewardship (see Appendix A). To track unit performance, the libraries were encouraged to attach no more than ten broad, objectively measurable metrics to the plan. These metrics were organized according to the university’s four goals, thus there are only two metrics for the teaching and learning scorecard to which strategies and tactics listed under focus area 1 are assigned:
• maintain or improve LibQUAL+® superiority mean score for Library as Place dimension; and
• maintain or improve LibQUAL+® superiority mean score for Affect of Service dimension.

While these metrics assess the performance of the strategic focus area at a high-level, both metrics focus on satisfaction, not the immediate, medium-term, and long-term impact of programmatic initiatives and services. Neither metric directly assesses the effectiveness of the libraries’ engagement initiative. Further, neither metric generates specific, actionable data to guide the improvement or development of library services.

The OSU Libraries currently views assessment as a shared responsibility that must be guided by the libraries’ vision and mission, be embedded within the libraries’ strategic plan, and guide change. Further, the libraries serve a dynamic population of over 60,000 students and 3,000 faculty members with interests in academic disciplines as varied as aerospace engineering and near eastern languages and cultures. Thus meaningful assessment requires a comprehensive, yet modular approach, as no one service model fits the needs of the entire university population.

Literature Review
Several libraries advocate for writing assessment plans to guide library assessment programs and post detailed lists of goals, performance objectives, metrics, assessment activities, and assessment timelines on their library websites. Some libraries have adopted the Balanced Scorecard to manage systematic and comprehensive library assessment, while others have adapted the Baldrige Performance Excellence Program, or Lean Six Sigma to provide a framework for assessment activities. Others have directly incorporated metrics into the library’s strategic plan or annually provide a set number of assessment objectives and related metrics as required by the university’s accreditor.

Engagement presupposes relationships, yet relationships, as an entity, are intrinsically difficult to measure. While there is abundant literature outlining the need for and the evolving role of liaison librarians, “as we continue to raise the bar about what we expect from liaisons,” we continue to lack “a sense of how to measure progress, how to use available time to the best advantage, how to develop priorities, and how to know we are on the right track.” Kenney advocates that libraries adapt “indicators that are motivating your university, not your library,” and “[shift] focus from what liaisons do to how their efforts impact faculty, students, and others.” She cites examples such as Cornell Library’s Count-it tool, designed to track liaison interactions with departments.

The few studies that do specifically evaluate library liaison programs focus primarily on faculty perceptions of the program, rather than the impact of the program on students or faculty work. Tennant’s survey of the University of Florida Health Science Center Library’s Liaison Librarian Program, for example, examined client awareness of the library liaison assigned to their department and client usage of liaison librarian services. Respondents were asked whether their relationship with the HSC Library had improved since the program began, however, survey questions did not explore the impact of these services on client work. Yang’s survey of Texas A&M’s library liaison program was also operationally rather
than outcome focused. Survey questions focused on faculty needs of, expectations for, and use of library liaison services. Like Tennant, the survey instrument also explored whether the existence of liaison services improved faculty communication with librarians. Ryans, Suresh and Zhang’s study surveyed academic deans, department chairs, and faculty, along with library liaisons and library representatives to evaluate the library liaison program. Their study also focused on evaluating performance of their program’s operational goals, rather than the impact of liaison services faculty.

Whether a liaison librarian program consists of traditional, embedded, or engaged librarians, the definition and measurement of the outcomes of librarian’s instructional and relationship-building activities is paramount to communicating the impact of the library’s contributions to the academic community it serves. The outputs of such activities, unfortunately, remain easier to quantify and qualify than the outcomes of such activities. “In the library context,” Markless defines outcomes “as the consequences of deploying services on the people who encounter them or on the communities served while impact is revealed “in individual cases or through more generally discernible changes” in a community’s knowledge, affect, skills, and abilities.

Development of a Logic Model to Frame Assessment for Strategic Area 1
Logic models—also known as the Theory of Change (ToC) methodology—provide a useful framework for comprehensively assessing a library’s strategic initiatives. The process of creating logic models—
Good logic models are “developed collaboratively in an inclusive, collegial process that engages as many key stakeholders as possible.” This allows the group to both establish consensus and surface their “values and beliefs about change processes and program results.” This also challenges groups to consider the external factors which influence programs and the assumptions on which programs are based and to articulate and define the theory underlying programs and services.

The logic model for focus area 1 of the libraries’ 2011–2016 Strategic Plan is a living document and was created with active input from internal stakeholders (see Appendix B). Focus area 1 subsumes the libraries’ engagement efforts and is primarily the responsibility of the Research and Education division. This focus area consists of five initiatives related to the university’s core teaching and learning goals:

- enhance information literacy instruction and development of learning objects and resources to enrich teaching and support multifaceted academic success;
- strengthen faculty and librarian collaboration by embedding library content and services in new instructional initiatives delivered by emerging technology with a particular focus on the Digital First Initiative, Digital Union Impact Grants, iTunes U and Distance Education;
- strengthen faculty/librarian collaboration in the Libraries Course Enhancement Grants program;
- improve the student experience by partnering with undergraduate academic support services, such as the Writing Center (CSTW), Honors and Scholars, the Undergraduate Research Office and experiential learning initiatives such as internships and service learning courses; and
- extend reference service and research consultation in new venues including residence halls; play a key role in academic programming in the Second Year Transformational Student Experience Program (STEP).

To develop the logic model for focus area 1, the assessment coordinator initiated the process by first gathering and reviewing university and library documents which both drive and inform the focus area and its corresponding programmatic initiatives and services. Any assessment must consider the libraries’ contribution to supporting the university’s curricular and aspirational goals to best communicate the libraries’ value to various stakeholders. Thus, of particular interest was the Curricular Experience at The Ohio State University document, published by the University’s Council on Academic Affairs. Locally referred to as the Curriculum Statement, this document outlines the expected outcomes undergraduate students who complete a degree will achieve. The Curriculum Statement is of significant relevance.
to the initiatives listed under the libraries’ first strategic focus area, especially as this area primarily targets undergraduate students and the faculty who instruct them.

The assessment coordinator then met with the associate director and the five department heads leading the Research and Education division to brainstorm a list of current library services and activities related to this focus area. She next pieced this list together with existing documents detailing university and library programs and services and drafted a rough logic model for the division’s leadership team to respond to both individually and collectively as a group. Team members were specifically asked to articulate and check the underlying assumptions on which the model was based and review the “if...then” statements around which the assessment questions, success criteria, and data-gathering plan would be structured. Discussion continued as the group worked to reach consensus on the underlying theory and logic supporting the assessment of both the libraries’ engagement initiatives and the impact of the strategy. The resulting logic model is available in Appendix B. Note the medium term outcomes listed for undergraduate students were directly taken from the university’s Curriculum Statement.

Assessment and Data-Gathering Plan for Strategic Focus Area 1

Once the theory of change is articulated via the logic model, the model functions as a framework for developing an assessment and data-gathering plan. This enhances the effectiveness of an assessment by helping library managers and assessment professionals to “[focus] on questions that have real value for your stakeholders.” To develop assessment and data-gathering plans, stakeholders use the logic model to develop both formative and summative assessment questions with the intention of gathering enough information to both improve a program, service, or initiative, and prove its success, or impact and value.

Comprehensive assessment plans incorporate a variety of perspectives, including:

- the outcomes of the program, expressed as “the extent to which progress is being made toward the desired changes in individuals, organizations, communities, or systems.”

Appendixes C–E outline the assessment and data-gathering plan for focus area 1, organized by the three perspectives listed above. Each perspective provides a list of relevant assessment questions; identifies the intended audience for the assessment results; indicates how the assessment information will be used; identifies the criteria for success; lists the existing data source or the needed data collection tools and methods; and provides a calendar for gathering, reporting, and analyzing the results.

The assessment questions in the relationships and capacity section of the plan, for example, focus on the products of these relationships, in terms of whether faculty view librarians as teaching partners for advancing the curriculum experience or undergraduates view librarians as partners for advancing academic success (see Appendix C). The assessment audience’s intended use for the information gathered is listed to the immediate right of each assessment question, with statements such as evaluation, marketing and promotion, and program planning and improvement. This focuses the assessment in an effort to avoid gathering data with no plan for utilizing the data to prove results or inform programmatic change. Success criteria are then listed and existing or needed data sources or collection tools are identified. Two criteria for success are currently listed next to the assessment question: Do faculty view librarians as teaching partners for advancing the curricular experience at The Ohio State University? One reads, “maintain or improve teaching collaborations with library faculty.” Recent conversations with the libraries’ Teaching and Learning leadership reveal that the depth of librarian/faculty teaching collaborations is as much of interest as the number of collaborations on an annual basis. Thus work is in progress to determine whether existing assessment initiatives within this department may inform the development of additional criteria for success which will address this concern and a data source or collection method to gather this information. The final column indicates that data pertaining to the faculty assessment questions will be collected quarterly and presented online via a management information system dashboard.
Assessment questions in the **quantity and quality** section of the plan focus on the outputs or the success of the implementation of initiatives listed under focus area 1 in the strategic plan (see Appendix D). This section does not consider changes in terms of knowledge, affect, skills, and abilities expected in the program’s targeted audience, but rather focuses more on number counts and measures related to satisfaction and service or program quality. Success criteria include statements such as “Number of undergraduate students participating in library partner programs increased between the 2014/2015 academic year and the 2015/2016 academic year.” Since the creation of sustained, engaged relationships with faculty is a central tenet of the strategic focus area—“How often do faculty request liaison librarian services to enhance information literacy instruction for the same course in subsequent years?”—it is listed as an assessment question for faculty with the corresponding metric: “Maintain or improve customer retention rate.” The customer retention rate is a standard marketing metric, which measures customer loyalty over time. Successful marketers recognize loyalty “as an avenue to develop a deeper relationship with customers,” and that “loyal customers usually require less investment from the business to maintain the relationship than the costs incurred to develop the relationship at the outset.” Thus customer retention rate is a key measure for evaluating the success of a library’s engagement initiative over time.

The **outcomes** section of the assessment plan was admittedly the most difficult section to write. The leadership team continues work to identify relevant assessment questions and measurable criteria for success. For some questions, baseline or benchmark data must be collected first, otherwise the libraries’ success measures are random. Quantifiable percentage increases in the criteria for success have deliberately been omitted, until a baseline may be established.

**Practical Implications/Value**

The overarching goal of the logic model development process is to construct a meaningful and manageable assessment plan that may both communicate the results or accomplishments of a program to interested stakeholders and inform program or service development. Logic models— with corresponding assessment and data-gathering plans—create focus, challenging program leaders to consider assessment from a variety of perspectives and for a variety of stakeholders or audiences. Most professionals understand that no quality assessment may be accomplished in a vacuum. The act of creating a logic model allows organizations to challenge their assumptions, articulate and define the theory on which their programs and services are based, and establish consensus regarding program results.

Relationships, along with the emotional connections established between librarians and the individuals they serve, are required for fully engaged practice. While a logic model and corresponding assessment and data-gathering plans are useful for framing and measuring the actual output and outcomes of librarian relationships, the tool is not suited, nor appropriate for guiding assessment for all focus areas listed in the libraries’ 2011–2016 Strategic Plan. The diversity of constituencies served by the OSU Libraries, along with the complexity of the libraries’ organization makes the development of a singular, relevant assessment plan that truly captures and communicates the impact of the libraries on advancing student and faculty success particularly difficult. Still, the logic model offers a flexible yet structured approach for planning and managing select library assessment activities.

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**Notes**


15. Ibid., III

16. Ibid., III, 1.

17. Ibid., 3.

18. Ibid., 7.

20. Elements of existing logic models and corresponding assessment and data-gathering plans for the libraries’ contribution to the university’s STEP initiative and a logic model proposed for informing the evolution of the libraries’ engaged librarian model as it pertains to research services were consolidated into the logic model and assessment and data-gathering plan for strategic focus area 1. For additional information about these existing models see: Sarah Murphy, Beth Black, Sophie Tullier, Emily Slager, and Alexis Collier, “Assessment Plan: AiA and the Second-Year Transformational Experience Program,” The Ohio State University Libraries, 2013, [http://go.osu.edu/OSUL_STEP](http://go.osu.edu/OSUL_STEP); and Sarah Anne Murphy and Craig Gibson, “Programmatic Assessment of Research Services: Informing the Evolution of an Engaged Liaison Librarian Model,” in Assessing Liaison Librarians: Documenting Impact for Positive Change, ed. Daniel C. Mack and Gary White (Chicago: Association of College and Research Libraries, In Press).


22. Ibid., 37.


Appendix A. The Ohio State University Libraries 2011–2016 Strategic Focus Areas

Teaching and Learning
1. Advance transformative teaching and learning by engaging with OSU faculty and support units to integrate library resources and services throughout the educational curriculum;
2. Provide library experiences and opportunities that inspire creativity, discovery, innovation and collaboration in support of university-level initiatives;
3. Offer enhanced and innovative research services to faculty and graduate students;

Research & Innovation
4. Increase the scale and scope of distinctive and digital collections and enhance access to and usage of these materials to support research and anytime, anywhere learning;
5. Increase the effectiveness of local print collection management and act to provide access to the full range of emerging “collective collections” regionally and nationally;

Outreach & Engagement
6. Engage with partners across the university to increase the amount, value, and impact of OSU-produced digital content;

Resources Stewardship
7. Develop a talent management program that highlights improvement, innovation, diversity and accountability;
8. Meet evolving user needs by engaging in a strategic review of facilities, along with the development and execution of a facilities master plan;
9. Build a robust, reliable, secure technical infrastructure for the libraries, including both human and technology resources; and
10. Raise external funds to support libraries’ priorities during the “But for Ohio State Campaign.”
Appendix B. Assessment of Strategic Focus Area 1, Logic Model

“Advance transformative teaching and learning by engaging with OSU faculty and support units to integrate library resources and services throughout the educational curriculum.”

<table>
<thead>
<tr>
<th>INPUTS</th>
<th>OUTPUTS ACTIVITY</th>
<th>SHORT</th>
<th>MEDIUM TERM</th>
<th>LONG TERM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and Learning</td>
<td>Instruction</td>
<td>Undergraduates</td>
<td>Undergraduates</td>
<td>OSU Baccalaureate Graduates</td>
</tr>
<tr>
<td>- Instructional Design Librarian</td>
<td>- Course-related instruction</td>
<td>- Recognize and select library services and resources that support their educational goals</td>
<td>- Develop and refine the skills needed to:</td>
<td>- Effectively and responsibly use information for problem-solving and decision making</td>
</tr>
<tr>
<td>- Undergraduate Engagement Librarian</td>
<td>- Survey assignment (freshmen)</td>
<td>- Incorporate institutionally supported library resources into their academic work</td>
<td>- Acquire, comprehend, and evaluate information and arguments</td>
<td>- Integrate, create, and apply new knowledge</td>
</tr>
<tr>
<td>- Support specialists</td>
<td>- Libraries’ credit courses</td>
<td>- Employ advanced search tactics to query search engines</td>
<td>- Integrate, create, and apply knowledge</td>
<td>- Recognize libraries—and the services and collections libraries provide—as a resource for lifelong learning and knowledge enhancement</td>
</tr>
<tr>
<td>- Online information and learning objects and other instructional tools</td>
<td>- STEP co-curricular activities (sophomores)</td>
<td>- Locate academic scholarship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- InfoLit Toolkit</td>
<td>- Online information and learning objects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- IDEATION Newsletter</td>
<td>Reference</td>
<td>Reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Subject librarians</td>
<td>- Consultations</td>
<td>- Consultations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- SCAS librarians</td>
<td>- Partnerships (CTSW, Undergraduate Research Office, Honors and Scholars)</td>
<td>- Partnerships (CTSW, Undergraduate Research Office, Honors and Scholars)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collections</td>
<td>- CLL/Subject Pages</td>
<td>- CLL/Subject Pages</td>
<td></td>
<td></td>
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<tr>
<td>- Distinctive print/digital</td>
<td></td>
<td></td>
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<tr>
<td>FACULTY/INSTRUCTORS</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Instruction</strong></td>
<td><strong>Faculty/Instructors</strong></td>
<td></td>
<td></td>
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<tr>
<td>- Course-related</td>
<td>- Recognize the library as a teaching partner</td>
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<td></td>
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<tr>
<td>instruction</td>
<td>- Collaborate with librarians to develop instructional content</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>- Course Enhancement</td>
<td>which integrates library resources into the educational</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grants</td>
<td>curriculum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Digital Union</td>
<td>- Advance undergraduate students ability to:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact Grantees</td>
<td>- Acquire, comprehend, and evaluate information and arguments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- InfoLit Toolkit</td>
<td>- Integrate, create, and apply knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Online information</td>
<td>- Formulate considered and reasoned ethical judgments for</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and learning</td>
<td>responsible use of information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>objects (ILOs)</td>
<td>- Champion library resources and services for lifelong</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- UCAT Course</td>
<td>learning and knowledge enhancement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Institute</td>
<td>- Maintain sustained teaching partnerships with OSU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Writing Across</td>
<td>librarians and services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the Curriculum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Reference**
- Consultations
- Partnerships
- CLL/Subject Pages
## Appendix C. Assessment of Strategic Focus Area 1, Relationships and Capacity

<table>
<thead>
<tr>
<th>Audience</th>
<th>Assessment Question</th>
<th>Use</th>
<th>Criteria for Success</th>
<th>Data Source</th>
<th>Assessment Calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNDERGRADUATES</strong></td>
<td></td>
<td>Advocacy</td>
<td>Students report the libraries support their educational goals</td>
<td>STEP Survey</td>
<td>Annually (April)</td>
</tr>
<tr>
<td>OSU Libraries</td>
<td>Do undergraduates view librarians and library staff as partners for advancing their academic success?</td>
<td>Evaluation</td>
<td>Number of undergraduate research projects mentored by library faculty</td>
<td>TEACH Database/RIV</td>
<td>Annually (May)</td>
</tr>
<tr>
<td>COLIT</td>
<td>Do undergraduates form positive relationships with library faculty and staff?</td>
<td>Marketing and promotion</td>
<td>Positive undergraduate student testimonials</td>
<td>Quarterly reports</td>
<td>Mar, June, Sept, Dec</td>
</tr>
<tr>
<td>Faculty partners</td>
<td></td>
<td>Program planning and improvement</td>
<td>Maintain or improve undergraduate superiority mean scores for each individual statement in the Affect of Service dimension</td>
<td>LibQUAL+</td>
<td>Feb 2015</td>
</tr>
<tr>
<td>OAA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FACULTY/INSTRUCTORS</strong></td>
<td></td>
<td>Evaluation</td>
<td>Maintain or improve teaching collaborations with faculty</td>
<td>SIS/TEACH Database</td>
<td>Quarterly (Dashboard)</td>
</tr>
<tr>
<td>OSU Libraries</td>
<td>Do faculty view librarians as teaching partners for advancing the curricular experience at The Ohio State University?</td>
<td>Marketing and promotion</td>
<td>Positive faculty testimonials</td>
<td>Interviews</td>
<td>Mar, June, Sept, Dec</td>
</tr>
<tr>
<td>COLIT</td>
<td></td>
<td>Program planning and improvement</td>
<td></td>
<td>Quarterly reports</td>
<td></td>
</tr>
<tr>
<td>OAA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Life</td>
<td></td>
<td></td>
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<tr>
<td>AREAS OF FOCUS</td>
<td></td>
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</tr>
</tbody>
</table>
### Appendix D. Assessment of Strategic Focus Area 1, Quantity and Quality

<table>
<thead>
<tr>
<th>Audience</th>
<th>Assessment Question</th>
<th>Use</th>
<th>Criteria for Success</th>
<th>Data Source</th>
<th>Assessment Calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduates</td>
<td>Do undergraduate students consult a librarian for help to write a paper or report greater than five pages?</td>
<td>Advocacy</td>
<td>Number of undergraduate students who use the libraries research consultation services increases in relation to the number of papers or reports greater than five pages increased between the 2013/2014 academic year and the 2015/2016 academic year</td>
<td>Literature</td>
<td>Quarterly (research consultations)</td>
</tr>
<tr>
<td>OSU Libraries</td>
<td>How many undergraduate students took advantage of library programs and services co-sponsored with another campus partner (CTS, Undergraduate Research Office, Honors and Scholars)</td>
<td>Evaluation</td>
<td></td>
<td>NSSE</td>
<td>Triennially (NSSE)</td>
</tr>
<tr>
<td>OMA</td>
<td>Number of undergraduate students participating in library partner programs increased between the 2014/2015 academic year and the 2015/2016 academic year</td>
<td>Marketing and promotion</td>
<td></td>
<td>Undergraduate Research Office</td>
<td>Semester and (OSF, CTSW)</td>
</tr>
<tr>
<td>Student Life</td>
<td>Maintain or increase the number of students who complete the survey assignment</td>
<td>Program planning and improvement</td>
<td></td>
<td>Writing Center</td>
<td></td>
</tr>
<tr>
<td>Faculty partners</td>
<td>How many instructors integrated the survey assignment into their introductory course?</td>
<td>Teaching and Learning</td>
<td></td>
<td>May, Aug, Dec</td>
<td></td>
</tr>
</tbody>
</table>

### Undergraduates: Consultations/Partnerships

<table>
<thead>
<tr>
<th>Audience</th>
<th>Assessment Question</th>
<th>Use</th>
<th>Criteria for Success</th>
<th>Data Source</th>
<th>Assessment Calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSU Libraries</td>
<td>Does participation in the STEP program encourage students to talk to a librarian?</td>
<td>Evaluation</td>
<td>Number of undergraduate uses of Library Ask Us and research services increased between the 2013/2014 and 2014/2015 academic year (includes in-person, phone, email, and chat reference)</td>
<td>Teaching and Learning</td>
<td>May, Dec</td>
</tr>
<tr>
<td>OMA</td>
<td>Did STEP students integrate library services and resources in their undergraduate research experience?</td>
<td>Marketing and promotion</td>
<td>Number of undergraduate research opportunities or number of undergraduate research opportunities requiring the use of library resources and services</td>
<td>KnowledgeBank</td>
<td></td>
</tr>
<tr>
<td>Student Life</td>
<td>How many STEP students participated in library-sponsored co-curricular STEP workshops?</td>
<td>Program planning and improvement</td>
<td></td>
<td>Undergraduate Research Office</td>
<td></td>
</tr>
<tr>
<td>Faculty partners</td>
<td>How many instructors integrated the survey assignment into their introductory course?</td>
<td>Teaching and Learning</td>
<td></td>
<td>May, Aug, Dec</td>
<td></td>
</tr>
</tbody>
</table>

### Faculty/Instructors: Instruction/IOs

<table>
<thead>
<tr>
<th>Audience</th>
<th>Assessment Question</th>
<th>Use</th>
<th>Criteria for Success</th>
<th>Data Source</th>
<th>Assessment Calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSU Libraries</td>
<td>Did faculty integrate library information and learning objects (ILOs) into individual courses?</td>
<td>Evaluation</td>
<td>Number of unique attendees at library-sponsored co-curricular STEP workshops</td>
<td>Information and Learning objects - TBD</td>
<td>Quarterly (Dashboard)</td>
</tr>
<tr>
<td>OMA</td>
<td>How often do faculty request liaison librarian services to enhance information literacy instruction for the same course in subsequent years?</td>
<td>Marketing and promotion</td>
<td></td>
<td>Information and Learning Objects - TBD</td>
<td></td>
</tr>
<tr>
<td>Student Life</td>
<td></td>
<td>Program planning and improvement</td>
<td></td>
<td>TEACH Database</td>
<td></td>
</tr>
<tr>
<td>Faculty partners</td>
<td>How many instructors integrated the survey assignment into their introductory course?</td>
<td>Teaching and Learning</td>
<td></td>
<td>May, Aug, Dec</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix E. Assessment of Strategic Focus Area 1, Outcomes

<table>
<thead>
<tr>
<th>Audience</th>
<th>Assessment Question</th>
<th>Use</th>
<th>Criteria for Success</th>
<th>Data Source</th>
<th>Assessment Calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSU Libaries</td>
<td>By graduation, are undergraduate students able to:</td>
<td>Advocacy</td>
<td>Number of judicial review cases related to plagiarism decreased</td>
<td>Student Life</td>
<td>Annually</td>
</tr>
<tr>
<td>COUT</td>
<td>acquire, comprehend, and evaluate information and arguments?</td>
<td>Evaluation</td>
<td>(<a href="http://studentconduct.osu.edu/policy/a">http://studentconduct.osu.edu/policy/a</a> sp/3-52)</td>
<td>Teaching and Learning</td>
<td></td>
</tr>
<tr>
<td>OAA</td>
<td>formulate considered and reasoned ethical judgments for reasonable use of information?</td>
<td>Program planning and improvement</td>
<td>Students view plagiarism tutorial</td>
<td>Google Analytics</td>
<td></td>
</tr>
<tr>
<td>Course-Related Instruction Survey Assignment/STEP</td>
<td>- Does students recognize and select library services and resources that support their educational goals?</td>
<td>Advocacy</td>
<td>Correlation between NSSE question 87 (number of academic papers of 6 or more pages that were assigned more than 3 times) and number of undergraduate uses of library Ask Us and research services</td>
<td>LibAnswers</td>
<td>February 2015</td>
</tr>
<tr>
<td>OSU Libaries</td>
<td>Does the survey assignment or participation in STEP help students to use and apply library services and resources in their academic work?</td>
<td>Evaluation</td>
<td>Means for junior student responses to the 2015 LibQUAL+ Information Literacy Outcomes questions will increase over the freshman student response means for the same questions in the 2013 LibQUAL+ survey.</td>
<td>NSSE</td>
<td></td>
</tr>
<tr>
<td>COUT</td>
<td></td>
<td>Marketing and promotion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OAA</td>
<td></td>
<td>Program planning and improvement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSU Baccalaureate Graduates</td>
<td>Do OSU graduates use library services and collections for problem-solving and decision making?</td>
<td>Advocacy</td>
<td>Criteria in development. Considering correlation between usage of library resources and various indicators of student success, including GPA, student retention, and 4-year graduation rate.</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>OSU Libaries</td>
<td>Are the OSU Libraries advancing undergraduate student success?</td>
<td>Evaluation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Collaborative Qualitative Research: A Consortium Approach to Exploring the Complexity of Student Learning Outcome Practices across Multiple Institutions

Donna Harp Ziegenfuss
University of Utah, USA

Stephen Borrelli
Washington State University, USA

Abstract
This collaborative qualitative study, utilizing data collected from 20 library consortium members, explores how institutions are designing, assessing, implementing, and disseminating student-learning outcomes (SLOs) at their institutions. A survey was conducted and follow-up interviews were analyzed using grounded theory methods. This two-part study first identified themes around SLO best practices, then uncovered a core grounded theory. Results discovered the importance of contextual and organizational structure factors and examined how those institutional factors might impact how libraries collaborate and interact in their campus cultures.

Introduction
The Greater Western Library Alliance (GWLA) SLO Taskforce¹ was charged with investigating assessment practices at GWLA libraries and how academic libraries impact student learning outcomes assessment at their participating institutions. This paper outlines the processes and findings for this collaborative qualitative research project investigating how GWLA institutions were integrating information literacy on their campuses and contributing to student learning success. Twenty-three institutions were surveyed and interview data were collected and analyzed from 20 academic libraries about campus assessment practices at three different campus levels: the institution, library, and department/college. Analysis of themes and related categories resulted in development of a conceptual framework that was used to design a three-day GWLA Assessment Symposium.² Going beyond that analysis, the data were re-examined using a grounded theory process to uncover a grounded theory that could be used to guide institutional reflection and analysis.

Literature Review
The library value movement posits that in the current environment, traditional peer comparisons are inadequate for demonstrating value to the parent institution. Instead, connecting library services with local institutional priorities and demonstrating impacts results in relevancy.³ In the seminal work on library value, multiple approaches for academic libraries to develop institutional relevance are identified. Developing and assessing student-learning outcomes is a primary avenue identified for demonstrating the value of the library in relation to student learning.⁴ Published evidence of library impact on student learning has historically been disconnected from institutional outcomes, and generally of the individual librarian/faculty collaborative nature, as opposed to programmatic approaches.⁵ While traditional inputs and output measurements remain valuable, libraries are increasingly focusing on institutional priorities such as student learning by adapting, adopting, and assessing student-learning outcomes programmatically to uncover institutional impacts.⁶

As the library value literature indicates, it is also important to investigate higher education change and organizational development issues more broadly. Other relevant literature indicates that economic, social, technological, and cultural issues are currently emerging and driving change in new directions on many campuses.⁷ There are calls for transformational change,⁸ encouragement for ‘disruptive’ education tools,⁹ and a reinvention of the college experience.¹⁰ In addition, findings
from part 1 of this study identify a need for investigating how higher education contextual and organizational structures are influencing how libraries are changing and functioning on campuses. One theory, Socio-Cultural Activity Theory,\textsuperscript{11} articulated in the 1990s by Engeström, aligns well with the emerging library literature, the higher education change literature, as well as the results from this study. This framework, grounded in the seminal constructivist theory of Vygotsky,\textsuperscript{12} has been utilized in many studies to theorize and describe a variety of work and learning environments or systems through the structure of goals and objects, activity towards an object, tools, community structures, and rules (see Figure 1). As related to this study, the activity of assessing SLOs is mediated through tools, processes, rules, and community. A second theory, expansive learning\textsuperscript{13} which is an extension of activity theory, focuses on the interactions and change between multiple activity systems. As libraries transform and become more embedded in the institutional structure and culture, awareness of campus activity systems and interactions will only become more critical to their value and success.

Figure 1. Activity Theory Model

![Activity Theory Model](image)

Methodology
In 2012, an action plan was developed to survey 32 GWLA institutions about SLO practices at each institution. The survey was designed and distributed electronically. Each survey respondent was also asked to provide a campus contact that was involved in SLO work on his/her campus to be contacted for further interview follow-up. Of the 23 institutions that responded to the survey, follow up interviews were scheduled at 20 institutions.

A plan for conducting interviews and collaborative qualitative analysis of the interviews involving seven librarians was established. Follow-up interviews began in spring 2012 and were completed in December 2012. Data analysis was ongoing during the interview process and completed in spring 2013. An additional inventory was compiled on published reports of assessment evidence, practices, and innovations, which were gleaned from the 20 interview transcripts. This data was used to recruit presenters for a November 2013 Librarians Partnering for Student Learning Symposium that was held at the University of Nevada, Las Vegas.

Survey Process
An electronic survey was distributed and 23 GWLA libraries responded to the survey (72% of the membership). The respondents answered a series
of questions about the presence and assessment of SLOs on their campuses. The purpose of the survey was to uncover what institutions had established information literacy (IL) SLOs, and at what levels of the institution the SLOs were located. Libraries were also asked if they were assessing faculty/librarian collaborations. From the 23 survey respondents, 20 people were identified for additional interviews.

**Follow-up Interview Process**
Throughout the spring, summer, and winter of 2012 interviews of the follow-up contacts were conducted by telephone via interview teams. From these interviews, written summaries were created, interviews were recorded, and the audio files were transcribed.

For part 1 of the qualitative study, the transcribed transcripts were then submitted to the qualitative analysis team, where sets of research partners analyzed and triangulated the interview data and compiled the findings. To begin the interview analysis, pairs of researchers coded four interview transcripts, one pair for each interview. Each researcher coded his/her interview independently first and then member-checked coding with his/her partner who had also coded the same interview. Each pair submitted a single set of coding. The coding from the four interviews were then compiled and analyzed for themes. Since not all institutions had a qualitative analysis package like NVivo or Atlas.ti to conduct qualitative analysis, the research team used Microsoft Excel to conduct the qualitative data analysis and to compile the results of the survey and interviews into themes and topics for further study. Tutorials on using Excel to do qualitative analysis were provided to researchers. The transcripts were analyzed using grounded theory qualitative methodologies and open and axial coding strategies. From the first set of four interviews, a preliminary set of 17 categories were uncovered and used to define the codebook for the research process. The 17 categories were consolidated and re-evaluated to create a set of 5 major themes. A framework was developed from the themes and used to plan the GWLA Student Learning Outcome Symposium in 2013.

In part 2 of the study, two of the original researchers continued the search for additional theoretical grounding, and recoded and reevaluated data uncovering a theory that grounded the findings and presented a theory for helping institutions analyze their own institutional context so as to better integrate the academic library into institutional processes.

**Results**

**Survey Results**
Seventy-two percent of GWLA institutions responded to the survey. The survey results demonstrated that the presence and assessment of information literacy SLOs at GWLA institutions occurs at a variety of levels. Fifty-seven percent of the 23 institutions that responded to the survey reported that they have campus-level SLOs, but only 26% reported that those campus-level SLOs were assessed. A similar disparity was identified at the college/department level between the presence and assessment of SLOs with 61% reporting the presence of SLOs but only 26% reporting assessment of the SLOs. However, at the library level, 65% of institutions reported the presence SLOs, and 48% reported that the SLOs were assessed. In addition, when institutions were asked if librarian/classroom faculty interactions were assessed, 61% (14 of the 23 institutions) reported that they do assess these types of collaborations, and 35% (8 institutions) reported they do not assess these collaborations; one institution reported that they do not know if these types of collaborations were assessed. The gap between what institutions reported about the presence of SLOs, and the actual assessment of SLOs, drove the questions for follow up interviews with a purpose of trying to identify how SLOs are assessed.

**Interview Results, Part 1: Conceptual Framework**
Audio-recorded interviews were conducted and transcribed. Open and axial coding processes, as described by Strauss and Corbin, were used for the first four interviews and resulted in the identification of 484 codes organized into 71 categories. These categories were analyzed using a recursive process of recoding, collapsing and combining codes, and renaming of categories until the remaining categories were deemed to be unique. From this process, 17 unique core categories were identified and defined. The 17 original categories were: (1) strategies for planning; implementing and integrating SLOs; (2) roles/responsibilities for assessment of SLOs; (3) collaboration; (4) communication issues; (5) tools-instruments-resources for SLOs; (6) accountability
and reporting of SLOs; (7) curriculum and instruction; (8) departmental relationships; (9) culture and priorities issues; (10) structures, policies, and administration; (11) professional development; (12) challenges; (13) leadership; (14) change related; (15) opportunities; (16) general (SLO catch-all); and (17) information literacy topics. These core categories were then used to code the remaining interviews. No new categories emerged from the remaining 16 interviews, indicating data saturation.

During the second round of coding, the 17 categories of codes were collapsed and refined into five main themes. The five themes were: (1) curriculum and instruction; (2) strategies for planning, implementing, and integrating SLOs; (3) collaboration and communications issues; (4) roles/responsibilities for assessment and SLOs; and (5) SLOs structures, policies, and administration. These five themes were returned to the researchers for confirmation, each researcher taking one or two themes, to verify that no additional themes had emerged.

Using the five themes and code frequency data, a conceptual framework was constructed to relate and explain the themes. For triangulation and confirmation purposes, another GWLA taskforce member, who had not been involved in the coding process, reviewed and refined the framework. The resulting framework (see Figure 2) consists of three main parts: Deconstructing the Process of SLO Assessment, Building Partnerships, and Embracing Change and Opportunities. Since the main focus of the interviews was to uncover SLO practices and processes across GWLA institutions, it is not surprising that 55% of the coding resides in the first column of the matrix that includes two of the five themes and coding about SLO design, implementation, assessment, and dissemination.

The framework structure, across the rows, aligns the SLO design and assessment process to other cultural, contextual, and organizational institutional factors. The codes and themes in the second and third columns, although smaller in number, were consistently present and related back to the main SLO assessment theme.
After the development of the conceptual framework and the SLO symposium, two of the original researcher team members collaborated to continue data analysis. The purpose of this additional analysis was to take the study to the stage of theory identification. Interview data were recoded and reanalyzed with a more conceptual focus examining the three different institution levels. Recoding resulted in a more detailed and conceptual description of the SLO contextual factors and uncovered how opportunities and challenges of the design, implementation, and distribution of SLOs are mediated at the different institutions. The six conceptual themes that emerged from this additional coding process were building awareness, power and/or ownership, embedded in or on the fringe of culture, opportunity advantages, organizational structure, and strategic leveraging. Taking a grounded theory approach and revisiting the literature after revised conceptual coding provided a broader lens of perspective and yielded an identification of Socio-Cultural Activity Theory.  

After theory identification, the data were recoded once again to confirm alignment of the data to the main components of the Activity Theory Model which consist of: (1) rules and policies, (2) community, (3) division of labor (roles and responsibilities), and (4) mediating tools and

<table>
<thead>
<tr>
<th>Deconstructing the Process of SLO Assessment (55% of the Codes)</th>
<th>Building Partnerships (33% of the Codes)</th>
<th>Embracing Change and Opportunities (12% of the Codes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Themes: 1) Curriculum and Instruction; 2) Strategies for Planning, Implementing and Disseminating SLOs</td>
<td>Themes: 3) Collaboration and Communication; 4) Roles and Responsibilities for SLOs</td>
<td>Themes: 5) SLO Structure, Policies and Administration</td>
</tr>
<tr>
<td>Designing and articulating SLOs (library, course, program, institutional levels)</td>
<td>Collaborating with faculty, departments, and administrative groups</td>
<td>Identifying drivers and challenges and opportunities within the cultural context around SLOs</td>
</tr>
<tr>
<td>Implementing and integrating SLOs at all levels</td>
<td>Developing relationships with campus and professional partners and units</td>
<td>Participating in professional development to broaden scope of practice and understand the higher education context</td>
</tr>
<tr>
<td>Designing assessments and collecting results</td>
<td>Evaluating and leveraging organizational culture (opportunities and barriers) and synergy</td>
<td>Jumping on opportunities and events uncovered</td>
</tr>
<tr>
<td>Distributing and disseminating SLO information and results</td>
<td>Articulating roles and responsibilities</td>
<td>Broadening the scope of practice</td>
</tr>
<tr>
<td></td>
<td>Improving communication between libraries and other campus audiences</td>
<td>Utilizing support from campus-wide units (e.g., teaching center, institutional research)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conducting research to measure progress (use the assessment cycle to document and measure)</td>
</tr>
</tbody>
</table>
artifacts. Both researchers recoded data, and all data could be aligned directly to activity theory components confirming the suitability of this activity systems theory as a lens for understanding the research data. Figure 3 below demonstrates the alignment of qualitative categories and themes from the part 1 conceptual framework analysis to the Library Activity Theory and IL SLO object space model of part 2.

**Figure 3. A Library Level Activity System Model**

Further literature searching exposed a related theory, Expansive Learning, which is called Third-generation Activity Theory, and can offer explanations for contextual factors interaction inherent in multiple systems. Figure 4 demonstrates the alignment of the part 2 conceptual themes analysis across the three different levels of an institution and at the intersection of the three different activity systems.

Library/faculty interactions were influenced by socio-cultural factors; library/campus level interactions were driven by organizational structure and policy as well as change. The interaction of all three systems or what Engestrom calls “co-configuration” focuses on the theme of strategic leveraging of opportunities, challenges, and needs.
Discussion of the Results
Part 1: Creation of the Conceptual Framework
The conceptual framework for designing, implementing, assessing, and disseminating SLOs (see Figure 1) developed from the consolidated GWLA data in the first part of this study, can provide guidance for individual libraries as they work to evaluate their own contributions to campus efforts related to articulating, embedding, and assessing SLOs. The conceptual framework emphasizes the importance of building relationships, embracing change and opportunities, and considering contextual and organizational structures when planning or sustaining successful SLO design and implementation projects. These findings are in line with current library research that focuses specifically on developing strategies for building library-faculty collaboration and trust and consideration for the complex set of contextual factors that can vary widely across institutions. These factors may become critical or pivotal barriers or opportunities related to successful SLO implementation. Dissemination and findings from this study indicate there is no one magic bullet method for integration of library IL SLO or successful SLO assessment implementation. The themes of communication, collaborations/partnerships, embracing opportunities, addressing challenges, and the rethinking of roles and responsibilities were evident across all institutions that participated in the study. However, the variation in contextual/cultural factors, organizational structures, internal and external drivers, as well as, leadership and levels of proactivity also appear to result in very different practices and outcomes. One librarian stated, “I think the library’s leadership needs to be more proactive in promoting the library’s role as an information literacy agency on campus.” Therefore, the conceptual framework can be used as a tool to establish a process for developing library awareness, and establishing priorities for libraries to take leadership roles. Findings from this study suggest that institutions reflect on their own institutional context and therefore...
tackle their unique complex situation in their own way. Best practices or assessment strategies successful at one institution may not always be easily replicated at other institutions. In addition, since each institution and library may be at a very different place related to the articulation and implementation of SLOs, this framework may provide a more flexible and holistic option for reflection and strategic decision making than a step-by-step assessment implementation procedure or checklist approach to assessing SLOs.

Data from the study also indicate that the planning process for campus-wide SLOs is often a top-down or administrative initiative, resulting from accreditation concerns, or an institutional focus on evidence-based decision making or assessment. One example of how having assessment support at the top drove SLO assessment is, “Our institution is very, very driven by the evidence-based learning outcomes of students. We don’t just call them student-learning outcomes. The Office of the Provost for the past five years has made it very clear that every school has to have evidence based learning outcome. And that of course does include information literacy at the departmental level. So we are very much embedded in this kind of approach.” It was also noted during analysis of this study data, at both the campus and library levels, considerable efforts are being made to standardize assessment efforts. Libraries and institutions are investing in the assessment effort, creating assessment and planning librarians, or instruction and assessment positions to focus efforts and provide accountability. One institution remarked, “One of the things that’s happening in response to our last accreditation visit is that we have developed this Office of Assessment of Teaching and Learning. And they are responsible for conducting undergraduate assessment.” Most member institutions indicate that they are in the process of learning to assess. Libraries are applying many approaches and instruments in their assessments, using qualitative and quantitative methods often modeled after national tools like the AAC&U Value Rubrics, TRAILS, RAILS, and SAILS.

**Interview Results, Part 2: Identification of Underlying Theoretical Foundation**

Re-examination of the data using the activity theory model focused our analysis more on the contextual factors influencing SLOs and less on the actual SLO assessment. The highest occurrence of coding related to the rules and policies component of the activity theory model was located in the institutional level data. Although this may not be a surprising finding, it is important to be aware of this when trying to work within an institutional context. Themes such as *accreditation as a driver, change, leadership, organizational structure, institutional culture,* and *getting a place at the decision making table* can now be connected to the institutional level structures and culture. As librarians, it appears to be critical to get plugged into the institutional culture. One librarian expressed concern about this and stated, “…there is also the idea that on this campus, and I think probably we’re not unique at all, people…still think of libraries as the place that has the stuff and…they don’t necessarily look [at] the librarians as partners in their teaching…and we don’t have faculty status here and so we’re not at the table.” Librarians should consider taking a more proactive approach for inclusion in reform and change initiatives, as well as, routine operating procedures at their institution which may vary depending on the culture, leadership, and engagement of administrative units with assessment. One institution discussed the challenges, but also the opportunities, when librarians take on new roles, “I would say the biggest challenge that we’ve had is the fact that we have kind of taken on...being experts on course design and so we have had pockets of faculties who sort of questioned that or why our librarians doing this, they don’t teach. So, it has been a big kind of image remake and marketing opportunity for us.” This concept of librarians as change agents is an emerging theme in the library.

**Three Institutional Vignettes**

Of the 20 institutions we analyzed, institutional coding profiles varied. Exploring the data using the components of activity theory helped to uncover the different priorities, foci, and initiatives at different institutions. We will present three different institutional profiles here to demonstrate the alignment of interview coding, categories, and themes to the theoretical model.
Table 1. The Bigger Picture University Profile

<table>
<thead>
<tr>
<th>Institution Level Coding</th>
<th>College/Department Level Coding</th>
<th>Library Level Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Community</td>
<td>Community</td>
</tr>
<tr>
<td>Division of Labor</td>
<td>Division of Labor</td>
<td>Division of Labor</td>
</tr>
<tr>
<td>Rules</td>
<td>Rules</td>
<td>Rules</td>
</tr>
<tr>
<td>Tools / Artifacts</td>
<td>% of Total Codes</td>
<td>% of Total Codes</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td></td>
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<tr>
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<td></td>
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<td>3</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>codes</td>
<td>43.3%</td>
</tr>
</tbody>
</table>

The Bigger Picture: The first vignette is an institution that stood out with exceptionally high coding frequency numbers at the institutional and library levels and very low levels at the college/department level (see Table 1 below). This large public research institution located in the western US reported SLOs at all three levels of the institution. Assessment is reportedly driven by accreditation and there is a central assessment office, which may account for the larger number of codes around the structure and process of community at the institutional level. Library SLOs are aligned to the institutional SLOs and there are assessment representatives in each unit. SLOs developed out of the faculty senate with no library involvement but there is evidence in the library of assessment professional development. At the library level the high coding frequency for division of labor (roles and responsibilities) is attributed to instances of discussion about the roles librarians play in faculty collaboration and assessment of SLOs by designing assignments, SLOs, collecting data, and disseminating SLOs. At the college/department level however, there is a very low number of codes and the discussion is only focused on the variation of assessment and culture across departments.

The Community in the Library: The second institution, also a large public university in the western US, has the largest concentration of code frequencies at the library level, specifically in the community component of the library level (see Table 2 below). In this decentralized institution a centralized assessment culture of SLOs is a challenge, but locally in the library there is a strong culture of assessment. Historically this institution has focused on library as place and collections, and less on student learning.

Table 2. The Library Community University Profile

<table>
<thead>
<tr>
<th>Institution Level Coding</th>
<th>College/Department Level Coding</th>
<th>Library Level Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Community</td>
<td>Community</td>
</tr>
<tr>
<td>Division of Labor</td>
<td>Community</td>
<td>Division of Labor</td>
</tr>
<tr>
<td>Rules</td>
<td>Community</td>
<td>Division of Labor</td>
</tr>
<tr>
<td>Tools / Artifacts</td>
<td>Community</td>
<td>Tools / Artifacts</td>
</tr>
<tr>
<td>% of Total Codes</td>
<td>Community</td>
<td>% of Total Codes</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>17.2%</td>
<td>16.2%</td>
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<tr>
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<td>14</td>
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</tr>
<tr>
<td></td>
<td>0</td>
<td>16.2%</td>
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<tr>
<td></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>61</td>
<td>66.7%</td>
</tr>
</tbody>
</table>

A Lot of Teaching Responsibilities: In this last vignette the high coding frequencies at the college/department level are attributed to a high percentage of the discussion focused on discussing specific teaching projects in departments by librarians in the interview. This Midwest research institution is in the process of moving to a liaison model approach with faculty and therefore this may account for the higher department/college coding frequency numbers (see Table 3 below). The interviewee reported that there is a good balance at this institution between research and teaching but reports challenges of time constraints that dictate preparation issues. There is more of a focus on curriculum development than assessment.
Table 3. The Library Focused on Teaching University Profile

<table>
<thead>
<tr>
<th>Institution Level Coding</th>
<th>College/Department Level Coding</th>
<th>Library Level Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Community</td>
<td>Community</td>
</tr>
<tr>
<td>Division of Labor</td>
<td>Division of Labor</td>
<td>Division of Labor</td>
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<tr>
<td>Rules</td>
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<td>Rules</td>
</tr>
<tr>
<td>Tools/Artifacts</td>
<td>Tools/Artifacts</td>
<td>Tools/Artifacts</td>
</tr>
<tr>
<td>% of Total Codes</td>
<td>% of Total Codes</td>
<td>% of Total Codes</td>
</tr>
<tr>
<td>10</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15.3%</td>
<td>30.6%</td>
<td>54.2%</td>
</tr>
</tbody>
</table>

As you can see from the brief vignettes of these 3 different GWLA institutional libraries, each institution has a slightly different focus and in the interviews focused discussion on different issues. Unique situational factors and cultures can impact institutions differently. Findings from this study emphasize the importance of developing awareness of your institutional culture, organizational structure, and academic priorities. By being aware of the environment and also tuned into emerging priorities and initiatives, librarians will have opportunities to be proactive and step-up and engage with their academic community. Libraries are positioned to increase the institutional value to their parent organizations by drawing on internal teaching expertise and developing new skill sets in instructional design or other areas within the parent institution where leadership or expertise is desired.

Limitations of the Study
As with any research project, there are process and methodology limitations in this study. Not all GWLA member institutions participated in the study; this was a purposive sample of volunteers interested in SLOs. Therefore, since participants self-selected, participation may not be a true representation of the consortium. In addition, although interviewees represented each institution, they were not selected by the role they played at their institution. Therefore the information they provided may be limited to their own personal library role or limited by their personal knowledge about the larger institution.

The data analysis in this study was done in Excel due to the lack of access to expensive qualitative analysis software by the participating researchers. Using qualitative software like NVivo or Atlas.ti would have enabled a more comprehensive and accurate method for coding data and drawing conclusions. In order to understand the study findings, it is also important to take into account that the qualitative analysis part of this study was explorative in nature with a purpose to identify possible topics or gaps for future GWLA sponsored research study. It should also be noted that the negative and positive coding instances of themes are not teased apart to isolate negative and positive coding separately; they are combined together under the major category/theme frequency numbers to demonstrate the need for exploration in the most commonly described topics/issues area.

Finally, taskforce researchers with a variety of levels of qualitative expertise conducted the research. Despite this limitation, the taskforce was able to set up an effective process for collaborative research and triangulate coding with partners. Now that the process is defined, it will be easier to replicate this process and use this method as a possible model for conducting GWLA collaborative qualitative research in the future; however, we did experience some accuracy and logistical issues in this first attempt at collaborative qualitative research using Excel.

Conclusions and Recommendations
The impact that a unique institutional culture and context has on the ability of an organization to come together around designing, assessing, and disseminating SLOs was the most interesting finding in our data. Some institutional efforts are bolstered through an institutional commitment to evidence-based decision making while other institutions reported that a decentralized organization, a lacking culture of assessment, or lack of leadership could deter success in developing and implementing SLOs. Other related limitations are academic freedom issues, fear of negative impact on tenure and promotion and the location and status of the library staff within the institutional structure. Many libraries reported that they are actively building a culture...
of assessment and creating positions to support SLO efforts. Additionally, information from the interviews suggests that “planning the process for SLOs is often a top down initiative, resulting from accreditation drivers, or a presence or lack of presence of an institutional focus on evidence or assessment.” This is an area that might merit further exploration and research in conjunction with the emerging economic and political issues in higher education, which impact the ability to staff and fund assessment efforts.

Another interesting aspect of the data analysis evolution centered on differentiating between collaboration and campus-wide partnerships. As the analysis progressed, the researchers saw collaborations as more related to individuals working together, whereas partnerships focused more on developing alliances or working partnerships with other campus units. These are two very different things. It appears from the data that “partnerships” could have a broader and more powerful impact on the work done in the library when integrated with the opportunities for librarians interacting at different campus levels as compared to “collaborations” focused on one-on-one interactions. Therefore, one recommendation for future research is to focus on studying how the presence of partnerships, as compared to collaborations, specifically might impact the process of designing, implementing, assessing, and disseminating SLOs at various levels of the institution.

Data indicated that curriculum development might be an area fruitful for more study. As one interviewee in this study noted, “Often the process of curriculum development does not include incorporating assessment. Instead, assessment of learning is considered something to be addressed separately, after the curriculum is developed.” This practice seems to run counter to the current practice of “backwards design” which includes the steps of outcomes, assessment, and then curriculum development. Research in this area could shed light on how libraries are integrating assessment into curriculum level.

For the second part of this study that linked the study data to Engestrom’s Activity Theory, there are many implications and recommendations for library practice. Analyzing the library landscape and how the library interacts, interfaces, and embeds within both the campus and departmental level could benefit strategic planning. This study data indicates the importance of considering the broader aspects of interaction and partnership when designing, implementing, and disseminating IL SLOs. Awareness of the larger institution culture and what initiatives are “hot” and being funded will provide opportunities for being proactive and engaging with the campus community. Awareness of new initiatives might also provide opportunities to extend library roles or take on new roles.

Even though each GWLA institution reported on a variety of methods, strategies, and organizational approaches based on their unique contextual and cultural structures for designing, implementing, assessing, and dissemination of SLOs, there are commonalities in the motivators and drivers for assessment across institutions, such as accreditation reviews, program redesigns, and a desire to move to a more evidence-based driven culture. Institutional contexts and cultures, campus academic priorities and initiatives, leadership at both the institutional and library levels, and changing roles of librarians are themes that emerged from this study and are important factors to consider when planning the design, implementation, assessment, and dissemination of IL SLOs.

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Notes
1. Members on the GWLA SLO taskforce committee included: Arizona State University, Brigham Young University, Texas Tech University, University of Arizona, University of Colorado-Boulder, University of Houston, University of Illinois at Chicago, University of Kansas, University of Missouri, University of Nevada Las Vegas, University of Utah, Utah State University, and Washington State University.


What Role Can Peer Benchmarking Play in Planning for the Future of Research and Teaching Technologies?

Jenn Stringer  
University of California, Berkeley, USA

Lynn Rohrs and Samantha Guss  
New York University, USA

Abstract  
Institutional leaders are asking libraries and IT units, as service providers, to provide data about service use, service quality and return on investment as they make decisions about resource allocation. In 2012, New York University developed a Peer Benchmarking Methodology for prioritizing research support needs by benchmarking themselves with more than a dozen peer institutions. The University of California at Berkeley borrowed and adapted NYU’s methodology as the starting point and used it to benchmark teaching and learning services along with research services for a planning and community building initiative across the campus. Here we present the methodology and discuss the value of utilizing this benchmarking framework to concisely and clearly represent to key stakeholders where services rank compared to peers, the specifics of what it would take to improve these services, and how to prioritize resources for the best return on investment. Relative merits and possible downsides of utilizing this methodology are also discussed.

Introduction  
In 2012, a team from NYU Information Technology Services (ITS) and the NYU Division of Libraries responded to a request from senior university leadership to perform a gap analysis, comparing NYU’s centrally provided research support services to those of its peer institutions to assist with resource allocation as NYU works to raise its research profile. The methodology used for this, initially created and conducted at NYU, was adopted and further expanded and refined by UC Berkeley in 2013 in a multi-department initiative to benchmark and plan for both research and instructional technology services. This paper demonstrates the value and wider applicability of this methodology by bringing together both groups to compare and contrast experiences with the process, illuminate its benefits, and to suggest other applications.

Background/Problem Statement  
While libraries and centralized information technology (IT) organizations have developed tools and methodologies to assess, compare themselves, and report on their services, the majority of those metrics are quantitative in nature. Some of those initiatives include: the EDUCAUSE Core Data Service, Campus Computing Survey, and ARL Statistics. LibQUAL+® is a fantastic example of how libraries are beginning to look at qualitative measures of library services, but a resource of that nature does not currently exist for teaching and learning and research technology services. Both NYU and UC Berkeley had specific contexts that supported the need for a more qualitative and service quality approach to evaluating the current state of their services.

NYU Context  
New York University (NYU), founded in 1831 and located in the heart of downtown Manhattan in New York City, is the largest private university in the United States with more than 44,000 students (approximately half of which are graduate students) and 3,100 full-time faculty. In anticipation of NYU’s 200th anniversary, an NYU Framework 2031 initiative produced a 2006 document that defined NYU’s 25-year strategic direction. One of the primary goals outlined was NYU’s aspiration to become one of the top two to three dozen research universities in the world.
Since 2006, NYU has started, attracted, or incorporated no fewer than eight significant new research initiatives and centers towards this goal, a trend that is expected to continue. Input from the first wave of new research faculty recruited to NYU revealed shortcomings in the central support services researchers require and in many cases had had access to at a prior institution.

In Spring 2012, a request was made by the senior vice provost for research for NYU's central Information Technology Services (ITS) and the NYU Division of Libraries to jointly “conduct a gap analysis of the IT-related services provided for researchers at those institutions from which faculty are likely to be recruited as part of the Science Initiative and from CUSP partner institutions.”

Essentially, what research-related services would new faculty expect NYU to provide, based on their experiences at their previous institutions? How did NYU’s research services compare to those at the other universities it considered its peers? To answer these questions, our team in ITS and the libraries devised a plan to benchmark our services against those at other universities.

NYU’s Development of the Methodology
The term “benchmarking” describes a method used by an organization to compare itself to peer organizations or others with the goal of understanding best practices and metrics, and gauging its performance against others. Although at one time benchmarking focused mainly on imitating others, more recently the focus has turned to acquiring explicit/tacit knowledge for the purposes of innovation: this new knowledge, “once integrated with previous internal knowledge of the firm, creates new knowledge that may give rise to improvements and innovations.”

Utilizing an external, strategic/competitive benchmarking methodology seemed well suited for comparing NYU’s research services to those of its peer institutions.

Resources Summary
NYU approached its benchmarking project by forming a core strategic team to devise a methodology and steer the project. This core team was comprised of six representatives from ITS and the libraries, including the dean of the libraries and the CIO in ITS plus high-level directors of staff who provide research services of some kind. In addition to the strategic team, fourteen total subject matter experts (SMEs) from several departments in ITS and the libraries were dispatched to carry out the data gathering and analysis in their areas of specialty. We estimate that approximately 1,000 person-hours were dedicated to the entire process over a three-to-four-month period.

1. Selecting Peers
The first step of the peer benchmarking process was to define and select which institutions we consider “peers.” NYU’s peers were selected by the project’s strategic team, who used prior knowledge, as well as findings from some preliminary research, to select fourteen institutions to use for the investigation. These 14 (University of California at Berkeley, Cornell University, Columbia University, Duke University, Carnegie Mellon University, Princeton University, University of Southern California (USC), Johns Hopkins University, University of Toronto, University of California at San Diego, Indiana University, University of Pennsylvania, and University of Michigan) included public and private institutions of similar size to NYU and with similar science research profiles, plus several partners in the Center for Urban Science and Progress (CUSP) initiative. Many of these are considered “aspirational peers”—that is, they may not identify NYU as a (research) peer today, but NYU strives to be in their league in the near future. The Polytechnic Institute of Brooklyn, while not considered a peer by our measures, was also included in the analysis, since it was about to be incorporated into NYU as the Polytechnic School of Engineering.

2. Selecting Services
NYU’s Strategic Team was responsible for selecting the research services to be included in benchmarking, although input from the subject matter experts was also taken into consideration. The thirteen services selected drew heavily from existing services provided centrally by the libraries and ITS at NYU, but also added others that were either provided on a limited basis by schools or departments or were simply not part of our portfolio yet, but likely would need to be eventually. These thirteen services, plus NYU’s criteria for benchmarking them, are listed in Appendix A.

3. Gathering Data
Each of the fourteen SMEs worked alone or in pairs on one to four services related to their main roles
at NYU; for example, the GIS specialist worked on benchmarking GIS-related services. The SMEs met several times with a member of the strategic team, who explained the goals of the project and the general guidelines for his or her assignment, and a general guidelines document was created and circulated by the strategic team as well. Aside from that initial guidance, however, SMEs were largely encouraged to use their subject area knowledge to shape their data collection and criteria. Most SMEs constructed their benchmarking criteria based on what they found by exploring services at the other universities; they did not begin with lists of what they were looking for, but constructed those lists iteratively throughout the investigation. The NYU team also looked at services available to every faculty member at that institution (not including those requiring specific school or department affiliations), and limited the investigation only to web searching and exploration, in an attempt to mimic a faculty member’s discovery process.

This process resulted in a variety of qualitative and quantitative data collected by each SME, and some services had much more complex data capture systems than others (related to the complexity of the service itself). Figure 1 shows an example of a service with a more “simple” data capture scheme, while Figure 2 illustrates the initial data capture for a more complex service.

Figure 1. Service with “simple” data capture
Figure 2. Service with “complex” data capture

<table>
<thead>
<tr>
<th>Potential Services</th>
<th>Facility</th>
<th>Virtual Space</th>
<th>Service Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>NYU</td>
<td>10</td>
<td>Library + ITS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>IT (Software)</td>
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<tr>
<td>B</td>
<td>Peer Institution 1</td>
<td>10</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>5</td>
<td></td>
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<tr>
<td>C</td>
<td>Peer Institution 2</td>
<td>5</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>D</td>
<td>Peer Institution 3</td>
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**Software License**

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<th>B</th>
<th>D</th>
<th>E</th>
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<tbody>
<tr>
<td>Physical Access</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Virtual Access</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Service Provider</td>
<td>Library + ITS</td>
<td>IT (Software)</td>
<td>Library + CIESIN</td>
<td>Library + IT (Software + virtual server)</td>
</tr>
</tbody>
</table>

**Software**

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<thead>
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<th></th>
<th>A</th>
<th>B</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIS</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Image Analysis</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Other</td>
<td>No</td>
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<tr>
<td>Design</td>
<td>No</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tbody>
</table>
The next challenge was to collapse all of the rich data collected by the SMEs into something much smaller and more easily understandable by non-specialists. All of the SMEs compiled interim reports, which provided summaries of the service offerings across the peer institutions, indicators of what were the strongest service models for a given service area, and how each of the peer institutions stacked up. Figure 3 shows an example of one of these interim reports:
Figure 3. Interim Report for one service
The interim reports made it much easier to quickly understand where NYU stood within each service area compared to its peers. However, it became clear at this point that if these reports were going to be shared with people who had limited time and limited understanding of the nuances of these services, we needed to come up with a way of standardizing the reports so that all of the service area summaries had the same format and would be easy to digest relatively quickly.

At least one of the SMEs was already converting some of his qualitative evaluations into a numeric ranking system; based on this idea, the tiered method was created. By this point, each of the SMEs (or teams) had a fairly good impression of which institutions were the best in their area, so they were asked to identify the characteristics that those top-tier institutions had in common (that is, the things that put them in the top-tier). These characteristics could be things like relatively high numbers of staff, the training level of staff members, support for methodological research, the number of software packages supported, quantity or quality of training offered, the existence of a facility, and the availability of walk-in help, just to name a few. After the top tier qualifications were identified, SMEs used the same principles to determine what would represent a tier lower for that service, and so on.

All of the peer institutions, plus NYU, were then distributed among four tiers for each service area, helping to clearly identify where NYU stood across all of the services relative to its peers. It also helped the strategic team focus on the specifics of what it might take for NYU to move up into a higher tier, what it would take for NYU to remain in its current tier (which could require additional resources to meet the increased demands associated with greater numbers of researchers), and then to prioritize next steps based on these specifics.

In most of the service areas explored, NYU did provide many of the service dimensions, but had fewer staff providing the support than the higher-ranked institutions, sometimes substantially fewer. This lower level of staffing usually resulted in less breadth and/or depth of a service offered. The tiered process was also somewhat iterative: the general approach was to distribute the peer institutions among four tiers by the distinct observed service offerings, but sometimes that was inadequate in representing tiers of service level. In one case, the strategic team and SMEs knew what a top-tier service provider could offer based on services at other institutions. Even though those institutions were not among the peers NYU had chosen for this project, it was decided that information should be captured by defining our highest tier using the criteria observed there—meaning that none of NYU’s peer institutions were listed as being in the highest tier for that service. In another case, the service level provided by multiple top-tier institutions far exceeded the next observed service level. In that case, the team defined the second-highest tier with characteristics that none of the peer institutions exhibited, thereby creating a goal for improvement that was more reasonably attainable than the highest tier.

5. Summarizing
Even after the tiered process standardized the output considerably, the results still needed to be arranged into a presentation format. The strategic team designed a two-page format and finally a one-page format that included a service description, criteria used for assessments, tier rankings, and recommendations, and the SMEs and an administrative assistant worked to incorporate each service area into this format.
Figure 4. Format of one-page summary

RESEARCH INFRASTRUCTURE:
NAME OF SERVICE

Description
Description of service

Benchmarking Criteria
- Criterion 1
- Criterion 2
- Criterion 3
- etc.

Summary of Findings
<table>
<thead>
<tr>
<th>Tier</th>
<th>Description</th>
<th>Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>characteristic 1</td>
<td>List of institutions that are Tier 4</td>
</tr>
<tr>
<td></td>
<td>characteristic 2</td>
<td></td>
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<td></td>
<td>etc.</td>
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</tr>
<tr>
<td>3</td>
<td>characteristic 1</td>
<td>List of institutions that are Tier 3</td>
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<tr>
<td></td>
<td>characteristic 2</td>
<td></td>
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<td></td>
<td>etc.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>characteristic 1</td>
<td>List of institutions that are Tier 2</td>
</tr>
<tr>
<td></td>
<td>characteristic 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>etc.</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>characteristic 1</td>
<td>List of institutions that are Tier 1</td>
</tr>
<tr>
<td></td>
<td>characteristic 2</td>
<td></td>
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<td></td>
<td>etc.</td>
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Suggestions/Recommendations for NYU: XXX

<table>
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<tr>
<th>To remain Tier 2</th>
<th>Action 1</th>
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<td>etc.</td>
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</table>

<table>
<thead>
<tr>
<th>To move to Tier 3</th>
<th>Action 1</th>
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<tbody>
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<td></td>
<td>Action 2</td>
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<td></td>
<td>etc.</td>
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</table>

<table>
<thead>
<tr>
<th>To move to Tier 4</th>
<th>Action 1</th>
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<tr>
<td></td>
<td>Action 2</td>
</tr>
<tr>
<td></td>
<td>Action 3</td>
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<td></td>
<td>etc.</td>
</tr>
</tbody>
</table>

6. Presentations
All of the SMEs, the strategic leadership team, and other interested parties were invited to a round-robin style session of presentations, which took place in August 2012. SMEs presented short summaries of their process, the criteria they came up with, and why they reached their conclusions and recommendations. This session was informative for the senior leaders who were present, but also for all of the SMEs who had been working relatively separately, aside from a few small group meetings during the project. In addition to sharing findings and feedback about the project itself, it was also a valuable opportunity to learn more about others’ day-to-day work and the various trends and concerns across all of the service areas.

7. Response to Original Request
With the completed “one-pagers,” the supporting information from the more robust interim reports, and input from the presentations, the strategic team had the information they needed to respond to the original request for a gap analysis.
of NYU’s centrally provided research services. The dean of the libraries and CIO of ITS wrote a report and presented the findings to the senior vice provost for research and the research deans from NYU’s schools and colleges in a key meeting to address issues related to expanding NYU’s research imprint. The praise from this group was high; they said that the overall benchmarking methodology used was extremely effective and easy to understand. The standardized “one-pagers” summarized a lot of information that could have been difficult to convey and compare. This output enabled them to get to their task of prioritizing which service areas to distribute limited funds to immediately and to envision the path it would take to have a more robust central research support infrastructure in line with those offered by NYU’s peers over the next several years.

Berkeley Context
UC Berkeley is a public research institution and the flagship of the University of California. There were 36,204 students as of fall 2013, including 25,951 undergraduates and 10,253 pursuing graduate degrees and 1,620 full-time and 616 part-time faculty members dispersed among more than 350 degree programs.  

Public monies for the UC system have continued to make up a smaller portion of funding and in 2012 it accounted for just 12% (down from 34% in 2002), and at the same time, the amount of available research funding has declined. The campus has moved to a data-driven decision-making model and in order to make funding decisions in the research and teaching and learning technology areas, it was imperative that we be able to provide a framework for those decisions.

Berkeley’s Adaption of the Methodology
The University of California at Berkeley (Berkeley) took the NYU framework and adopted and adapted it to fit their institutional context and needs. Also, because Berkeley understood what the end product was—the one-page summary report—they had a head start on how to approach the work. It was approached as a project from the beginning and a project manager was assigned to coordinate the benchmarking process. The goal of the project was to ensure that UC Berkeley maintains the highest quality services to support research and teaching by:

1. benchmarking Berkeley technology services with peer institutions;
2. developing a set of recommendations around future resource realignment and investments; and
3. fostering collaboration and a shared understanding across domains and service areas.

Building on the goal to foster collaboration across units, Berkeley engaged multiple partners in this effort. The project team had members from the following units across campus: Educational Technology Services, Research IT, Libraries, Berkeley Resource Center for Online Education, and Infrastructure and Platforms IT. The full group was about 30 people from across those units with the core team sized at about 20 members. They also built in project meetings every two weeks for the full group. These meetings were used to brainstorm criteria, share ideas about process, coordinate outreach to other institutions for data gathering, and, most importantly, to iteratively share findings with a broader group to get input, insights, and suggestions early on. Each team presented on their initial findings at least twice and then presented their final “one-pager,” including suggested strategies for investment to move Berkeley to higher tiers.

The team also took the data gathering one step further by creating what they called “deeper dives” which were targeted phone calls and e-mail outreach to certain schools that the teams needed more information from to tier them appropriately or find out more information about “exemplars.” This produced a much richer picture of service offerings and enabled teams to refine criteria and rankings even further (see Appendix B for Berkeley’s service list and definitions).

NYU and Berkeley took this revised methodology and worked together to develop a short document, “Peer Benchmarking in 13 Steps” that outlines the process in a succinct way.

Outcomes
What Went Well
There were a number of things about this benchmarking methodology that worked very well. One significant benefit was the way the project empowered the staff members who served as subject matter experts, many of whom were junior level. The process recognized their expertise and gave them the opportunity to interact with
and make recommendations directly to senior leadership, while allowing them to learn more about the service models, have wider conversations in their service areas, and set evidence-based goals.

Likewise, the seminar or workshop-style sharing of results was very valuable. Input from everyone involved made the process iterative at every step, and at NYU only in retrospect did the strategic team realize that even more interaction among SMEs during the process would have been ideal for information sharing and improving the process. Berkeley capitalized on this realization and held biweekly meetings with the full team and the SMEs for every service area presenting their findings at two different stages of the project at these meetings. This interaction helped staff and leadership at both institutions understand that these relationships were important. Sharing results together was also instructive for the team members, many of whom began the process not knowing about all the service areas or who provided them.

NYU’s team did not interact with the service providers at peer institutions, but making those connections would have been valuable as well, and Berkeley decided to add this element when they embarked on their own benchmarking project.

While the benchmarking methodology presented here may sound complex, and certainly involved a lot of coordination of staff and stakeholders, its simplicity was ultimately one of its strong points. The schema for organizing the data made the criteria and recommendations accessible to stakeholders and much easier to compare across areas and prioritize future plans. The methods were easy for staff to use and easy to explain to leadership. The level of detail in the data allows decision makers to create a multi-year roadmap (not everything needs to be done at once) and create an overarching strategy for improving research services and teaching and learning services on campus.

**Tangible Outcomes**

Based on the work done using this methodology (and the resulting recommendations from senior leadership), central research services at NYU allotted three new FTE positions during the first fiscal year after the conclusion of the benchmarking project. As predicted, ITS and library staff continued to feel the impact of NYU’s new science initiatives across nearly all of the service areas that were benchmarked. By the second fiscal year, all three of the original new positions had been filled, and three additional new FTE positions were allotted, all for building infrastructure and services to help researchers manage and preserve their research data (these all came directly from the outcome of the benchmarking work as well). After the departure of the director of e-systems and research services in ITS (who also served as co-director of data services), her position was redefined to focus solely on supporting research (including high performance computing and data services).

Berkeley has used the benchmarking framework and data as a way to spark institutional investment conversations on the campus with both leadership and service teams. It is being used as the basis for the research and teaching and learning IT strategic planning process. It has already supported the decision-making process regarding the allocation or reallocation of resources particularly in the high performance computing and collaboration tool areas.

**Challenges and Limitations**

Despite the many positive outcomes, the methodology presented here does have some limitations, and it is important to be upfront about these.

First, the time commitment is significant and should be one of the primary considerations when considering a benchmarking project of this scale. Both NYU and Berkeley felt it was worth the time spent, but both consumed at least 1,000 person-hours to complete the projects. Using subject experts usually equates to a large project team, meaning that more time must be allocated for training and management.

We are also aware of at least a few potential biases that could impact the data collection process, especially since the subject matter experts doing data collection are invested in the topic and the outcomes of the investigation. We describe these as: self-flagellation bias, in which an SME might rate his or her own institution lower because they are more critical of their own service and in turn may unintentionally imply the need for more funds; the “grass is always greener on the other side” bias, in which other institutions’ services...
seem more impressive than they are because they are superior to our own; and presentation bias, in which attractive websites and well-presented materials could be seen to correlate with high-quality services. In addition to these biases, staff members also feel responsible for the quality of the services they provide, and may inappropriately conclude that their service being in a lower tier means they are doing a poor job in their work. Managers should be especially cognizant of this last point and reinforce frequently to team members that benchmarking is for the purpose of evaluating service models, not evaluating staff performance.

Furthermore, the benchmarking process itself has some inherent limitations. One is that the practice of benchmarking is usually described as a cyclical process, repeated periodically over time and incorporated into routine business practices—and not a one-time activity. This is especially germane in IT and library research services, since many if not all of them are constantly evolving, and other institutions are growing and changing their services at the same time we are. NYU approached research peer benchmarking as a succinct project, but is aware that revisiting it in the future would be wise.

We recognize that presenting data in “tiers” makes this exercise look more rigorous than it is, and that many of the service area definitions are somewhat amorphous and have dependencies on each other, so cannot be isolated in practice the way they were isolated here for analysis and prioritization. Another limitation is in our approach to data collection: SMEs built their ideas of a high-quality service based on those currently in existence at NYU/Berkeley or its peer institutions. This approach assumes that the top-tier institutions have everything, meaning that we were likely to omit any service characteristics that are very cutting edge or uncommon. Finally, our investigations focused on services available centrally to everyone. In reality, faculty members likely do not care whether a service is available centrally or from a department or school, only whether it is available to them. We necessarily made this tradeoff, knowing that we have the most potential impact on services offered centrally at NYU and that centrally offered services tend to be more cost effective.

Next Steps
The comparative conversations between NYU and Berkeley about how, who, why we did this have been fascinating and helpful. Having a common, flexible methodology that a campus can adapt and work on its own while coming together at the right moments with others could be very powerful. The team is looking to socialize this framework and methodology with other institutions to see if they are interested in utilizing it and creating a larger community of practice to share improvements and perhaps even results.

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References


7. Paul Horn, personal communication, April 2012.


Appendix A: NYU Service Definitions and Criteria

1. Survey Research

Description: The goal of a survey research support facility is to provide researchers with assistance developing a survey, collecting their data, and analyzing their results. More robust services also provide assistance to researchers formulating and selecting the methodology used to collect their data, sample their population, and analyze their data.

Benchmarking Criteria: Web survey tool, Walk-in support facility, Non-web services (e.g., focus groups, paper/telephonic surveys), Methodological support, Tutorials/classes, Additional support for a fee, Research assistantship for a fee, Staffing

2. Qualitative Data Analysis (QDA)

Description: Support for Qualitative Data Analysis (QDA) involves access to QDA software packages (the most common being Atlas.ti and NVivo) and staff expertise to provide consultation and training workshops on those packages and, in some cases, methods.

Benchmarking Criteria: Consistent access to software (Nvivo, Atlas.ti), Consultation services, Workshops (consistency and level), Amount/type of staff training

3. Data Finding

Description: Data finding services to help researchers locate data sets to use in secondary research. Data finding services can comprise reference services (often in the form of a dedicated staff member), finding aids such as LibGuides, or catalogs either devoted to data or designed to make data discovery straightforward.

Benchmarking Criteria: Data catalog (note: no evaluation of actual collections), Devoted librarian/staff member, Finding aids for data

4. Data Management

Description: Data Management services assist researchers as they are increasingly required to include data management plans in grant applications and as they find themselves managing ever larger and more complex data stores. This includes providing guidance on format and content of the data management plan itself, but can also incorporate other services (such as infrastructure/repository or metadata services) that assist the researcher in enacting a strong data management plan.

Benchmarking Criteria: Contacts or staff for data management, Use of dynamic Data Management Planning (DMP) tools, Partnerships between library and other units on campus, Online documentation/guidance, Institutional digital infrastructure, Local solutions for preservation of datasets

5. Science Library Services
Description: Research librarians with discipline expertise offer a range of services from collection development to consultations to partnering with research teams in an informationist role. These services are so tailored and varied that the tiers below reflect a broad review of subject specialist staffing and their most easily identifiable output, research guides. Note: research guides were scored by assigning a one to three point score for depth of the research guides, with one being rudimentary, two being average, and three being in depth. That depth score was then multiplied by the number of science research guides offered by the library.

Benchmarking Criteria: Number of science subject specialist librarians, Research guides

6. Restricted Data Facilities

Description: Restricted data facility is a physical space—and associated services and staff—designed to help researchers obtain and use secondary datasets from providers that require their data to be used in secure physical and technological environments because of the sensitive or confidential nature of the data.

Benchmarking Criteria: Facility for storing, accessing, and using confidential data, Staffing, Levels of access to members of the university community

7. Quantitative Data Support

Description: Quantitative data analysis support is a service designed to provide assistance to researchers who utilize statistical and quantitative methods in working with data. The service includes instruction and consultations and the range of topics includes computing techniques to extract data for analysis (e.g., web scraping) as well as programming and debugging support for software such as R, Stata, SAS, SPSS, and MATLAB. More robust services also provide assistance to researchers with formulating and selecting the proper methodology used to analyze their data. Increasing this service assists with large quantities of data and becomes associated with HPC.

Benchmarking Criteria: Walk-in support facility, Software support, Methodological support, Tutorials/classes, Support for a fee, Research assistantship for a fee, Staffing levels

8. High Performance Computing (HPC)

Description: Delivery and support of HPC resources including compute cycles, memory and storage for use by the NYU research community.

Benchmarking Criteria: Technical Support, HPC Documentation, Programming Assistance, Grant Writing/Administration, System and Software Administration, Training/Tutorials/Workshops/Course

9. Geographic Information Systems (GIS)

Description: GIS allows faculty, staff and students to view, understand, question, interpret, and
visualize spatial data in many ways that reveal relationships, patterns, and trends in the form of maps, globes, reports and charts. GIS can be applied across many fields of study to enhance learning and teaching—including but not limited to urban planning, archaeology, history, public health, politics, marketing, environmental studies, transportation, facilities management and real estate. (ESRI).

Benchmarking Criteria: GIS consultation and training, Spatial data, Facility, Software Offerings, Staff/Expertise

10. Data Visualization

Description: Data visualization resources and support are necessary to assist researchers with generating, analyzing, and sharing visual representations of large data sets (distinct from GIS/mapping and 3D printing activities). Data visualization resources include computational resources (e.g., hardware, software, and infrastructure) as well as specialized display equipment for complex visual outputs (e.g., stereoscopic displays for modeling/navigating spatial data, high-resolution displays for identifying small details and patterns in large data sets).

Benchmarking Criteria: Facilities and equipment, Software, Staff, Support/Instruction

11. Software Access and Distribution

Description: Centralizing software licensing to leverage NYU’s economies of scale for better pricing on research software across the globe. For this analysis, we have included only those packages consider research software for the humanities and sciences.

Benchmarking Criteria: Research Software Packages Available, Research Software Distribution

12. Digital Scholarship Services

Description: Services for digital scholarship enable the creation, manipulation, and management of digital content in all formats. These services may also encompass a range of digital publishing activities from simple content hosting or collaboration (on blogs and wikis) to full-scale digital publishing involving peer review, editing, markup, metadata creation, and online publication via platforms from online journal software to custom content hosting systems. Additionally, such services may include the development and refinement of software to support scholarly activities such as data mining, visualization, mapping, and other digital humanities practices.

Benchmarking Criteria: Level of staff support (from training to do self-service work up to full-scale collaboration in tools and methodology development), Extent of services (offered to most faculty versus selected), Integration of services, Enterprise-level content hosting systems (e.g., WordPress or Drupal), Journal publishing services (e.g., OJS or BePress), Content hosting (e.g., in an institutional repository), Tools for collaboration (e.g., basic blogs, wikis) and equipment and training for self-service creation, conversion, editing of digital formats

13. Preservation Repository
Description: Preservation repository activities include both service and research capacities for long-term storage of digital materials as well as institutional policies and commitments, including continually ensuring that the material remains available. (In contrast, “institutional” repositories are self-service storage areas that do not normally perform preservation functions other than citation and retrieval of the digital file as originally deposited.) The ability to preserve selected research content is increasingly an attraction for funding agencies and provides expertise needed by a variety of research projects.

Benchmarking Criteria: Centralized service, Institutional strategy, Active research agenda (pure or applied), External certification, Communications
Appendix B: Berkeley Service Definitions

Research Services

1. Data Analysis: Quantitative and Qualitative Tools

Description: Access to common software packages, including R, Stata, SAS, SPSS, and Matlab for quantitative analysis, and Atlas.ti and NVivo for qualitative analysis. Consultation, training, workshops, debugging of programs, etc. More robust support includes assistance to researchers with formulating and selecting the proper methodology used to analyze their data. Where the data is very large, there are connections to Research Computing/HPC. This service area also connects to Research Data Management (RDM).

2. Data Visualization and GIS

Description: Software, data resources, hardware, facilities, and services for geospatial/GIS and data visualization technologies.

3. Linked Open Data and Semantic Web

Description: Linked Open Data (LOD) is an emerging data federation and access phenomenon leveraging multiple standards and frameworks, including RDF in its various forms, including RDFa, RDF/XML, N3, NTriples. LOD is often associated with the constellation of practices and tools for creating and accessing it, collectively known as the Semantic Web.

4. Museums, Archives, and Special Collections

Description: This service area covers a range of software systems used for museum collection management systems, archival management systems, and special collections management systems. While this broad and diverse area can include digital collections, library (book) collections and catalogs are explicitly excluded in this consideration. This report does include public portals for discovery of content from these collections and tools for digital forensics, digitization, gathering collection statistics, reporting, etc.

5. Preservation Services

Description: Broadly available services for preservation and archiving of digital content. Note that this analysis focuses primarily on the availability of preservation services to users beyond the campus Library. The broader requirements for research data are examined more comprehensively in the report on Research Data Management (RDM). Preservation Services area also overlaps with the report on Museum, Archives, and Special Collections.

6. Research Application Development Support

Description: Coordinated provision of software development lifecycle (SDLC) tools; development staff; application hosting; and other support for development of software applicable to research topics and questions. Architectural and design consulting, recommendation of best practices in
this area.

7. Research Computing (HPC +)

Description: Includes provision of “traditional” HPC (highly parallelized computing); cloudbased HPC; and highpowered workstations (including VMs) to support computation at a level between a typical desktop/laptop and an HPC cluster or VM array. Secure compute, storage, data transfer, and data archiving are also in scope. Services here are provided for both research and instruction.

8. Research Data Management

Description: Research data management (RDM) covers a full life cycle of activities related to research data, from planning through collaboration, sharing, curation, preservation, discovery and reuse. Also included are services such as consulting, training, and documentation. The research community is the consumer of research data management services. RDM overlaps with several service areas: Research Computing; Preservation Services; Museums, Archives and Special Collections; and Data Analysis (Quantitative and Qualitative).

9. Survey Research Support

Description: Survey related activities within universities can be grouped into three general categories: survey operations, survey education and training, and survey software. Each requires different investment. To determine final rankings, we weighted the three categories: survey operations 50%, survey education and training 25%, and survey software 25%. Surveys for institutional research are out of scope for this analysis.

**Teaching and Learning Services**

10. Course and Program Evaluation

Description: Set of tools that centralize the process of evaluating faculty teaching on campus. The evaluation service can include evaluation instrument creation, student access to complete the evaluations and on-demand results reporting for appropriate audiences.

11. E-Portfolio

Description: E-portfolio is a set of tools and processes combined to aggregate, organize, and present an electronic collection of evidence of a student’s learning experience while on campus. E-portfolios can also support competency-based evaluation of students.

12. Instructional Content Creation
Description: Program with dedicated service space to support faculty in development of digital learning assets (e.g., videos, simulations, online learning modules, etc.) for use in on campus, hybrid, and/or online courses through services such as: course design and instructional development, content production and DIY support, platform support, tools development and integration, rights management support.

13. Learning Management System (LMS)

Description: Campus services that deliver online systems specifically designed for the delivery and communications of course content, online engagement between students and instructors, and the management of student work in support of face to face and hybrid classes.

14. Learning Spaces

Description: This category includes formal classrooms, computer labs, library training and study rooms, and other study spaces on campus. Excluded (though recognized as important) are informal learning spaces located in residence halls, student unions, cafes, etc.

15. Online Courses and Degree Programs

Description: Support for Online Educational Resources (OERs), MOOCs, fully online courses, and degree granting online programs at peer institutions. The target audience for these offerings tends toward external audiences and nontraditional students.

16. Technology Enhanced Teaching

Description: Training, consultation and support for pedagogical best practices of teaching with technology. Resources, equipment, software, workshops and training on current technologies for students and faculty that enables them to fully engage in the teaching and learning experience.

Enabling Services

17. Collaboration Tools

Description: General purpose tools, services and programs that enable students, faculty, and staff to communicate and work together with colleagues. They include: e-mail, calendaring, IM/chat, file sharing, document authoring, and workspace-oriented collaboration.

18. Google Apps for Education

Description: Collaborative tools and services that enable students, faculty, and staff to communicate and work together with colleagues, delivered via the Google Apps for Education productivity suite (e.g., Mail, Calendar, Drive, Groups, Sites, and noncore Google Apps).
19. Portals, Dashboards and Aggregators

Description: A curated experience composed of (1) an information dashboard that presents personalized, timely and relevant data and/or (2) a “one stop shop” for users to find information related to their role at the university.

20. Scholarly Networking

Description: An emerging service area that aims to capture and use information about scholars’ professional activities, often with an emphasis on research and publication. We are focusing on true scholarly networking services, rather than basic web hosting for individual scholars.

21. Software Licensing and Distribution

Description: Central purchases of licenses for, and/or distribution of, software to support research and teaching. These include: coordination of campus owned licenses, consultation on selecting and using software applicable to research and teaching problems, and, instruction, tutorials and consultation on software installation.

22. Video and Web

Description: Conferencing tools and services that enable individuals and groups to connect and collaborate via synchronous video and web conferencing.

23. Web Publishing

Description: Web content management and hosting service, training and consulting for individuals, groups and departments.
Abstract
A wide-range of output measurement is available and in use in public libraries across the US. Outcomes measurement has been applied by various organizations, and national research initiatives have attempted to establish outcomes and performance measures around the impact of public access computing in public libraries. However, when it comes to outcomes measurement or indicators of performance, there are no clear leaders.

Carolyn Anthony, president of the Public Library Association, set a call to action in 2013 to address the gaps in consistent and reliable performance measurement. To this end, a PLA Presidential Task Force on Performance Measures was established in July 2013 with a charge “to develop standardized measures of effectiveness for widely-offered public library programs and promote the training for implementation and use of the measures across public libraries.” The panel outlined the strategy for the PLA initiative, methods for establishing an outcome-based performance measurement and results, as of summer 2014.

Carolyn Anthony (PLA past-president) established a Presidential Task Force on Performance Measurement in July 2013 as her key initiative. The task force, chaired by Denise Davis (deputy director, Sacramento Public Library) is charged with “develop(ing) standardized measures of effectiveness for widely-offered public library programs and promot(ing) the training for implementation and use of the measures across public libraries.”

Participants and volunteers were invited from a broad base of public libraries, representing the geographically and operationally diverse library community (e.g., large urban, rural, library districts, library cooperatives, and state library agencies). Task force participants were clustered into three functional groups and the participants in each appear at the end of the article. Group 1 was established as the core strategy group to work with PLA staff and external researchers to develop the rubric and methods most relevant to outcomes-based performance measurement in public libraries and participate in alpha testing. This group will follow the project through

Introduction
The Public Library Association (PLA), a division of the American Library Association (ALA), has embarked on an ambitious multi-year initiative to establish a rubric for performance measurement with scalable models and tools for implementation. These measures build on the service measures established by PLA in 1987, Planning and Role Setting for Public Libraries: A Manual of Options and Procedures. The panel presentation focused on the purpose and strategy for the PLA initiative, describing the methods used to establish possible outcome-based performance measures and results, as of summer 2014.
completion. Group 2 began its participation in March 2014 after performance measure categories had been developed and tested. The role of Group 2 participants is to increase exposure of the performance measures and framework, gather additional feedback, and test measures among a broader but somewhat controlled group of public libraries. Group 3 is made up of advisors from other organizations with a stake in public library data collection.

The task force works in person and virtually, utilizing the ALA Connect space to communicate and post work products. Two researchers were hired to guide the development and testing of performance measures, Joseph Matthews and John Carlo Bertot. Carl Thompson (president, Counting Opinions) and his staff provide technical support to the project, developing the platform tools for the survey and output tools. This project is also informed by national studies of public library’s engagement with customers around public access computing, including The Edge Initiative and the US Impact Study.

Context
So, why is PLA undertaking this project? Despite previous efforts by PLA, the Institute of Museum and Library Services (IMLS) and many state libraries to introduce outcomes-based measurement around programming and other services, public libraries have been slow to adopt consistent methods to develop and report outcomes. The context for developing performance measures for public libraries comes largely from a tradition of capturing output measures—circulation, gate counts, program attendance, etc. Outputs do not reflect what libraries actually do, nor do they tell a compelling story for key stakeholders. Outcomes make it possible to demonstrate the real differences public libraries make in the life of the customer. PLA is committed to moving the public library community forward to outcomes and performance measurement by establishing simple to collect, meaningful measures.

Carolyn Anthony summed it up in her first letter as PLA president to the membership: “What is needed is a set of performance measures that can capture the services public libraries are currently providing in their communities, with guidelines for conducting the measures to ensure consistency and validity.” When PLA developed Output Measures for Public Libraries in the early 1980s, a frequent consideration was for measures that were “good enough” to capture the desired information without being so difficult or time-consuming that staff would be unlikely to carry them out as intended. Anthony continued, “Public libraries need this data to accompany the anecdotes they relay to funders regarding the outcomes of services offered and the resultant impact on the community.”

The task force has met several times over the last year or so and has realized that:

- Libraries traditionally report outputs (circulation, gate counts, program attendance, and so forth).
- Outputs alone do not actually reflect what libraries accomplish.
- Outputs alone do not tell a compelling story.
- Some confusion persists about the difference between an output and outcome measure.
- Some libraries are attempting to measure outcomes but the results are spotty and inconsistent.
- Outcomes actually demonstrate the real difference a public library makes in the life of the customer.

The task force also concluded that the profession needs a guide to assist libraries in the collection of meaningful measures. Rather than a one-size fits all approach, the task force has determined that multiple approaches should be developed to provide options to each library. Thus, the task force is developing three levels of data collection that a library might choose to follow.

Level 1—Provides a foundation for data collection that should be relatively easy to implement and will, it is hoped, enable a library to determine the outcomes from one or more programs (or a series of programs) that the library offers to its community. Suggested surveys are provided for a library to use.

Level 2—A library would gather data about a continuing series of programs, for example, early childhood literacy programs, over a period of time (several years perhaps). The library would track attendance at programs and hopefully link outcomes in parents/guardians, children, and other library users to library services.
Level 3—This level anticipates that a library develops partnerships with other organizations (e.g., schools, day care centers, pre-schools, etc.) so that more detailed data analysis could be achieved by combining library data with data from other community organizations. The goal of this data analysis is to identify the outcomes that library programs have on users.

This first phase of this project is only focusing on level 1 data. Subsequent phases of this project will add level 2 and level 3 data collection instructions and instruments.

The task force concluded that when a library is planning a program or a series of programs, the typical process involves:
• Pick a target population and service objective to study.
• Understand why that target population and service objective is selected.
• How do libraries know this service objective makes a difference?
• Determine what output and outcome data is to be collected.

Having a clear guide or best practices pertaining to the collection of outcome measures, as well as seeing some examples of how libraries have successfully collected and presented outcome data in a variety of settings became central to the task force’s earliest discussions.

As part of this commitment, this task force worked with PLA to conduct a baseline survey to understand current practice around performance measurement and outcomes, and interest and preparedness to collect outcomes data. The 2014 Public Library Data Service (PLDS) survey was used to collect information about current library practice in the area of outcome data. The optional section of the PLDS survey asked:
• Please indicate if you currently or plan in the future to capture measures, either outcomes (effectiveness) or other (input/output/process).
• Please list any other service area where the library captures outcome measures.
• Please describe how the library currently captures and/or uses outcome measures.
• Please indicate the importance to and readiness of your organization to capture outcome measures (1–5 scale).

• Please rank your top outcome measurement priorities.

This survey confirmed that there continues to be confusion within the public library community around outputs and outcome measures. One important way to remember the distinction between the two types of measures is that outcomes measures report change in the lives of people, not the outcomes that may occur in the library itself.

Broadly speaking, outcomes indicate the effect of a library service in the life of the user. Outcomes occur first in the individual and then in the larger context—the organization or community. Outcomes allow a library to assess its effectiveness and to answer an important question, “Are we doing the right things?”

The Institute of Museum and Library Services (IMLS) has suggested that:
• Outcomes [are] benefits to people: specifically, achievements or changes in skill, knowledge, attitude, behavior, condition, or life status for program participants.
• Outcome-based evaluation is the measurement of results. It identifies observations that can credibly demonstrate change or desirable conditions—for example, “Increased quality of work in the annual science fair,” “interest in family history,” “ability to use information effectively.” It systematically collects information about these indicators, and uses that information to show the extent to which a program or service has achieved its goals.

Slightly more than 1,500 responses were received to the 2014 PLDS survey, and of these, 942 answered one or more of the optional outcomes questions. Of the 942 responding, about 200 indicated they collected outcome measures. Follow-up contact by e-mail and telephone with these libraries was made to understand their outcomes-based measurement activities. Many public libraries graciously shared their data collection instruments and reports that were produced using the outcome data.

Figure 1 presents current measures reported by public libraries.
Responding to the question as to how important outcome measures are, fifty-nine percent (59%) think the importance of outcome measures is either very high or high—see Figure 2. And only twelve percent (12%) rate the importance of outcome measures as low or very low.

Figure 2 presents the importance ranking of performance measures reported by public libraries.
Figure 3 presents public library readiness to collect performance measures. Only 22% of libraries think they are ready to start gathering outcome measures as shown in Figure 3. Those libraries that rated the importance of outcome measures as very high or high also indicated that their libraries were more likely to be ready to start collecting outcome measures (low importance–low readiness). In general, smaller libraries indicated that they felt outcome measures were less important and that they were less ready to embrace outcome measures.
Figure 3. Readiness to Collect Outcomes Measures Readiness.

<table>
<thead>
<tr>
<th>Readiness Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very High (5)</td>
<td>61</td>
</tr>
<tr>
<td>High (4)</td>
<td>138</td>
</tr>
<tr>
<td>Neutral (3)</td>
<td>320</td>
</tr>
<tr>
<td>Low (2)</td>
<td>225</td>
</tr>
<tr>
<td>Very Low (1)</td>
<td>157</td>
</tr>
</tbody>
</table>

Based on the priorities of public libraries as established in this survey, the task force decided that level 1 surveys would be developed for library programs in the following areas:
1. Early Childhood Literacy
2. Encourage Reading
3. Community (Civic) Engagement
4. Economic and Workforce Development
5. Education/Life Long Learning
6. Digital Inclusion

Next Steps
The Task Force will be testing measures in the six categories during the months of September and October 2014. Encouragingly a number of libraries have indicated their desire to test the level 1 surveys. At the conclusion of the relevant program, library staff present a brief survey for each participant to complete. Surveys are being tested both on paper and in electronic formats. The library reports the survey results for each program to an online portal that the task force has created. At the conclusion of the data collection period, each participating library will receive a report presenting the results of their data collection efforts in one or more program areas.

The data from all of the libraries will then be carefully analyzed. In the fall 2014, the task force will reconvene to refine the framework. One important decision facing the task force is determining the best method and timeframe for testing at a national level.

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Endnotes
3. Ibid.
4. Ibid.

Additional Resources: Assessment in Public Libraries


Public Library Association, a division of ALA. “PLA Results Series Workforms.” Accessed September 8, 2014. http://www.elearnlibraries.com/workforms/. With primary author Sandra Nelson, the PLA Results Series has provided guidance to public libraries in metrics-based planning. The tools in this series include step-by-step instructions on planning and measurement, including outputs and outcomes. Print materials and online forms are accessible via e-learn libraries.


National Initiatives


Performance Measures Task Force
Group One
Arizona State Library, Archives and Public Records (AZ)
Douglas County Libraries (CO)
Frisco Public Library (TX)
Houston Public Library (TX)
Jacksonville Public Library (FL)
Las Vegas Clark County Library Dist (NV)
Montgomery County Public Libraries (MD)
Pennsylvania State Library/Pennsylvania Department of Education (PA)
Sacramento Public Library, Central Library (CA)
Skokie Public Library (IL)

Group 2
Charlotte Mecklenburg Library (NC)
Columbus Metropolitan Library (OH)
Multnomah County Library (OR)
Tampa Bay Library Consortium (FL)

Group 3
Institute of Museum and Library Services (IMLS) (DC)
International City/County Management Association ICMA (DC)
TechSoup (CA)
University of Maryland College of Information Studies (MD) Consultant
Time-Lapse Data: Longitudinal Assessment of Library Spaces

Camille Andrews and Sara E. Wright
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Ameet Doshi
Georgia Institute of Technology, USA

Robert Fox
University of Louisville, USA

Abstract
Updating, reassessing, and applying new innovations and insights to library learning spaces is a long-term process, one which Cornell University and Georgia Institute of Technology Libraries have engaged in for several years. In our panel, we described and updated attendees on the usage and satisfaction with our renovated and new collaborative, student-centered learning spaces over time and provided our perspectives on longitudinal assessment (from beginning efforts to more formalized research programs). We offered tips to help plan and initiate longitudinal assessment efforts, to analyze existing data and build on previous efforts to create a robust program, and to transfer knowledge gained from one context to another.

Albert R. Mann Library at Cornell created the Bissett Collaborative Center, a flexible study space, during its 2007 renovation with assistance from students who performed pre- and post-occupancy evaluations, observations, ergonomic evaluations of furniture, and literature reviews. Since then, library staff and students have done observations, surveys, interviews, usability tests, and ethnographic user studies such as photo diary exercises and ideal space design charrettes to investigate student needs for collaborative space, inform renovations to the Bissett Center and other areas, and assess satisfaction with, and the continuing impact of, space changes. We shared the evolution of our assessment efforts, along with an examination of how student design efforts influenced renovations of the library, out of which the idea of the library as a learning lab for students has grown. Finally, we demonstrated how student designs and library staff assessment endeavors have impacted spaces over time.

At Georgia Tech, the 2 West Commons was completed in 2009 with students driving the space redesign. A space utilization study was performed pre- and post-renovation, and additional utilization research was conducted in subsequent years. Conducting a valid longitudinal space utilization effort involves considerable challenges including maintaining consistency of data collection methods, and accounting for changes in layout, seating and other variables. In fall 2011 the G. Wayne Clough Undergraduate Learning Commons opened adjacent to, and connected with, the main library facility. There were two operating hypotheses regarding the impact the Clough Commons would have on the 2 West Commons and other spaces in the library. The first is that the Clough Commons would attract students away from the library (including the 2 West space) and the library gate count would drop. A second hypothesis was that the Clough Commons would have a “multiplier effect” on space utilization across the library/Clough Commons complex with resultant increases in gate count in both buildings. We found the latter to be the case, and discovered use modes in the Clough Commons and the library consistent with a “quiet versus loud” dichotomy, which those involved with Commons projects would find particularly useful for planning purposes.
A carefully constructed longitudinal assessment effort can illuminate macro- and micro-trends, which can assist with strategic planning as well as day-to-day operational issues. Strategies for implementing a valid and useful longitudinal space utilization study were shared with attendees, and benefits of investing in this type of assessment were discussed.

**Longitudinal Assessment at Mann Library**

Longitudinal assessment is a broad term, but for our purposes it means the ability to compare the answers to the same questions or measure the same variable over multiple periods of time. You will not always get the same answer, but the question or measure will remain the same.

Some examples of a longitudinal study for library spaces might include tracking the behavior or habits of people or measuring space usage by counting the number of students in a particular space over a period of time, which can provide insight into long-term trends.

Several times over the course of nearly ten years, Mann Library has been challenged to spend money within a short time frame. Because of narrow purchasing decision windows, we have:

- Purchased inadequate equipment, non-functional furniture or furniture not conducive to studying
- Thought the particular equipment or spaces were needed, implemented them, and found later that the students didn’t really want or need them.
- Purchased too much of one particular item and not enough of something else

Longitudinal assessment can provide a more holistic understanding of how and why students use library services and facilities, measure the impact of services and spaces, and show increases or decreases in use. It provides the data needed to make a decision when it is needed and prevents hasty, perhaps poor, data gathering and decision making. Whether or not the pressure is to spend funds from an endowment by the end of the fiscal year as in Mann’s case, there is a cost benefit to longitudinal assessment in that you know what you want to spend your money on, with no guessing involved. Finally, it can aid in making programming and service decisions based on trends, not just a singular data point, and show the impact of any changes made.

**User Studies of the Bissett Collaborative Center at Mann: Origins, Methodology, and Results**

The Collaborative Center was made possible by an endowment, which charged Mann with creating a collaborative space for students. We wanted to create a space that students could customize by moving furniture into different configurations and incorporate in that space the technology that students would need to work and create shared course projects. Because we wanted it to be a space in which students would study, we started the assessment process to learn what they needed in terms of furniture and technology, and we investigated the Cornell course curriculum to determine how much and in what form group work was being assigned. This space, and eventually other spaces, have been assessed and redesigned over time to reflect changes in teaching methods, curriculum, and study preferences of our continually changing student base.

In order to explain why our assessment did not yield great cross-comparable data, here is a brief summary of the assessment we have done in the last few years—only some of which were repeated. From 2005 to the present, we have used many of the same techniques to implement and then refresh the collaborative space, including:

- Interviews
- Ideal space design and photo diary exercise
- Focus groups
- Usability testing
- Surveys, both pre- and post-occupancy or renovation
- Literature reviews
- Observations of student space usage by students and faculty from Cornell’s Design and Environmental Analysis (DEA) department

All of these methods have led to multiple renovations or refreshes of the collaborative space. We have added furniture and technology that students have asked for, including:

- Softer seating and a greater variety of furniture, including booths, beanbags, and standing height tables
- Mobile whiteboards, screens, and partitions for privacy so that group work feels more private and less viewable by passersby
• Additional technology, such as large LCD screens and screen sharing technologies, sometimes integrated into the furniture.

Student furniture preferences were just a few pieces of the picture that we learned about in terms of student needs. Even though we were not as systematic in our efforts as we could have been, over time themes emerged for us in terms of student preferences for study spaces:
• Usage of our spaces, in particular the collaborative space, increased at night.
• The typical group size was not 6–8 as we had expected; rather, students were studying in groups of 2–4.
• Students wanted a variety of furniture in terms of size, shape, mobility, and adjustability.
• Basics, such as comfort, good and natural lighting, and adequate power, matter.

Ultimately we gathered some great data at particular times that helped us to create the types of spaces that students wanted, but we weren’t able to cross-compare and draw solid conclusions from our data as easily as we might have if we had started with a longitudinal design for our assessment.

Observation Case Study and Next Steps at Mann
Our observational studies are an instructive case study, not only in comparison to studies conducted by Georgia Tech, but also because they highlight overall issues with longitudinal assessment. In our first observations, students from Design and Environmental Analysis (DEA) created coding schemes and counted student numbers (both individual and group) and activities in the Collaborative Center and other spaces for periods of time varying from a week to a semester. In spring 2014, we began using SUMA (North Carolina State University’s open source tool which allows more standardized data collection: http://www.lib.ncsu.edu/dli/projects/spaceassesstool) with circulation students and library staff doing several observations a day for most of the semester. Three major issues we encountered were:

Consistent methodology and data collection. This is always important in assessment but doubly so with longitudinal studies. We had slightly different coding schemes for each set of observations (either created by students from the Design and Environmental Analysis (DEA) department or by librarians), so while the number of students and groups were counted each time, we were not able to compare other measures such as number of people eating or texting. In addition, without standardized data collection methods, even when we were taking the same measures, without agreement on what those measures meant, the data were not as valid. For example, we found that coders counted different things as reading (whether print books or on a laptop) and that we were not all in agreement about the definitions of certain areas of library floors or how we were counting kinds of furniture. Also, this spring data collection for most times stopped in March because our student employees were too busy, and over time, data were collected for different lengths of time at different times of day and semester, making comparison difficult.

Data management and curation. Students gave us data in various formats (such as spreadsheets, which were often not immediately importable into a database program, or just summaries in PDF). We had to extract the data and put it in a tabular format to even try to make comparisons. With different studies over time, even finding data and remembering if there had been any methodological issues such as lost counts, became an issue. Without proper data documentation such as readme files and without centralized storage, the utility of the data dropped.

Data reuse and communication. If you cannot find your data or if it is in a number of formats, then it is harder to reuse. Standardized analysis and reporting makes it easier to communicate as well.

Mann is addressing these issues in several ways, including:
• creating a warehouse of methodologies with training guides on our committee wiki;
• storing our assessment data, study participant key, and other materials in a single location (a shared Box folder) with more standardized file naming, structure, and data documentation;
• using Cornell’s Research Data Management Service Group’s best practices (http://data. research.cornell.edu/content/best-practices) on file naming structures, guidelines for
formatting tabular data, and creating basic readme files;
• investigating quantitative and qualitative analysis and visualization programs like Tableau (http://www.tableausoftware.com/) and Dedoose (http://www.dedoose.com/);
• creating a data management plan, much as researchers are increasingly required to do by funders such as the National Science Foundation; and
• updating our research question wiki with questions, possible data sources, and methods for gathering data (and noting which are longitudinal). Not all questions are longitudinal and even if so, others might be collecting the necessary data. Our Assessment and Communication unit does a fabulous job with our larger institutional studies, and other groups—like the University of Rochester and the Ethnographic Research in Academic Libraries project—are doing larger scale longitudinal qualitative studies that provided great models and toolkits for methodologies.¹

Ideally, in the future, we will do regular studies with repeated cross-sectional or longitudinal design and begin to look at developmental outcomes such as the impact of our spaces and services on student learning. However, even ad hoc and specific studies for short-term goals were useful. We got data for decisions and quick answers to relevant questions. The mixed methods in our different studies provided data from a variety of perspectives as well. With our current data, we can
• extract data from similar measures, recode and compare them long-term, and use in planning for future studies;
• look at data in conjunction with existing measures like gate counts;
• redo surveys and interviews at intervals; and
• insert at least one longitudinal question in similar future ad hoc studies.

The studies also improved our student engagement and response. Our students were very appreciative that we asked and value their opinion on “library as place.” We also gained a better understanding of our users, what they want and need, and where gaps are in what we do and do not know about them.

Starting long-term studies has helped build a culture of assessment, making it a part of what we do and getting administrative buy-in. It is also being translated into other areas like our service point task force, a group charged with investigating updates to our public services desk placement, which did focus groups this spring. We have also begun building partnerships and collaboration with other departments like DEA, Student Affairs, and our Assessment and Communication unit. The library is also increasingly seen as a learning lab. The use of student researchers gave us greater access to other students (who might have less inhibition talking to them than library staff) and insight into new methodologies, while we provided them with a real world problem and guidance on research.

Finally, our space popularity and satisfaction has increased. One of the longitudinal studies we did do was before and after surveys on the renovated collaborative spaces and our user satisfaction increased from about 3.6 to 4.6 out of 5 (3 being neutral and 5 being very satisfied), which we count as a great success.

Longitudinal Assessment at the Georgia Tech Library

In order to understand why the use of longitudinal data is valuable for the Georgia Tech Library, it is necessary to understand the context in which the library operates. Georgia Tech is a data-driven institution. Its presidents and provosts have been and are currently engineers for whom a data-driven environment is essential. These administrators want data to drive decisions, including those that impact the library.

To operate effectively in this environment, the library created an assessment cross-functional team in 2009. The team was formed with broad library membership and charged to develop an assessment program that would be practical to operate and coordinated across the entire library. It was to come up with a sustainable plan that would make more effective use of data. After completing its study, the team issued a report with several recommendations. The first was to have a plan to identify and catalog the present state of data in the library: what is being collected, who is collecting it, and where is it being stored? The second recommendation was to standardize the formatting of the data being collected and to use a common
language describing the data that would transcend any one individual data collector. Another recommendation was to create a centralized data repository that would provide convenient access and make longitudinal comparisons more feasible. In an effort to create as much transparency as possible, the team urged that the repository be open and fully accessible to all those within the library as well as outside the library. Ultimately this resulted in a prominent place for the “Statistics Dashboard” on the library website.

We believe it is possible to make library assessment data more transparent, especially in displaying trends over time. So often the instinct with library data is to share it widely within the library but doing so behind an intranet, for example. However, in our experience, making that longitudinal data openly accessible to all has led to positive outcomes for the library, particularly in regards to planning for new library spaces.

We would like to share the context and drivers within which three specific longitudinal data projects have proven to be useful to strategic objectives at the Georgia Tech Library, particularly in regards to space improvements. Specifically, we hope to demonstrate that longitudinal assessment can be a powerful tool when conducted in the appropriate context and when results are made visually compelling and openly accessible to all stakeholders. For each of the three projects, we discuss the context in which we conducted these projects and the outcomes for the library.

About two years ago the dean of the library and the administrative team noted that it would be helpful to have a dashboard from which they could draw upon for both short-term and long-term decision making. It was not immediately apparent that the dashboard would be used by those outside the library, and there was a real debate among the library assessment committee about whether or not to make it openly accessible. Ultimately we determined it could be easier for everyone to locate this data if it were linked on the library website.

The resulting Statistics Dashboard, hand-coded by Jay Forrest at Georgia Tech Library, unifies many data points reported to federal agencies as well as other institutions, such as the Association of Research Libraries (ARL). The dashboard also allows the inclusion of caveats and contextual notes to help explain discrepancies. It is important to note that the Dashboard is a work in progress, so it was not deployed as a fully-formed product but is rather in perpetual beta.
A major outcome from this data has been support for a library renovation involving the moving of print collections to an off-site facility and investing in the development of additional user space. This proposal was driven by two main longitudinal data trends that anyone can understand. On the left is the past 10 years of gate count, on the right, the past 10 years of print checkouts. It is important to note that although print checkouts have declined dramatically, other items such as reserves or gadgets have increased or remained steady. From an “opportunity cost” perspective, this data-driven decision to move collections off-site makes sense both to library leadership and to the leadership of the institute.

The second project incorporates the library’s use of observational techniques on several occasions to study space utilization in commons areas. The first set of observations was undertaken in 2008 with the primary purpose of studying how students interacted with the Library East Commons (LEC), the first commons space at Georgia Tech designed primarily to support collaborative endeavors. The LEC opened in 2006 and was fully equipped with library-supplied computers and peripherals. It was very popular with students and reached maximum capacity early in the day. The 2008 observations looked at whether students in the space were working collaboratively as intended or using the space individually. It also looked at group size and whether any group members were using technology. The 2008 study also compared student use of the LEC to their use of other areas in the library.

Information from the 2008 observations helped inform a 2009 renovation of a second collaborative commons area (2 West). In 2010, a second set of observations was undertaken utilizing essentially the same instrument as in 2008 to obtain longitudinal information. The 2010 study looked to see how students were using the 2 West commons and if that increased use of the space post-renovation came at the expense of LEC utilization. The study showed that while there was some attrition in utilization of the LEC when the newer 2 West opened, overall utilization of library spaces continued to increase, thus the study helped set the context for future space renovation activity.

In 2014 the architectural design team hired for a renewal of library spaces wanted to understand the need for study space, especially quiet spaces. In addition, they wanted to gain insight into how library space utilization shifted after the Clough Commons was built. The Clough Commons is a 220,000 square foot learning commons with 700+ commons seats intended for collaborative study and attached to the library. An interesting point to note is that we actually changed the instrument slightly because we felt like there was no real value to counting the size of groups. Group sizes of 2–3 persons had remained consistent over the past two iterations. So one of the takeaways is that even with longitudinal work, it may be possible to stop counting some metrics that are overly burdensome if clear trends are becoming apparent.

The third longitudinal assessment project has been an analysis of 10 years of LibQUAL+® data from 2003–2013. This was prompted by the impending Southern Association of Colleges and Schools (SACS) reaffirmation process. Organizing the data for the SACS effort has proven quite valuable in connecting strategic goals and outcomes from the
strategic plan to actions taken by the library and survey results.

Investigating the 10 years of LibQUAL+ data has provided additional insight into the “desire” and “minimum acceptability” for print materials among faculty, which has direct implications for the library renewal project.

Finally, the library is working to make the 10 years of LibQUAL+ quantitative data open access. We reached out to ARL prior to making that decision to make sure this was okay. In putting the data out there, the hope is that the SPSS files could be used as part of an MLIS project or any other myriad uses.

To conclude, the Georgia Tech Library has a remarkable opportunity to renew the facility, and as the architectural design team attempts to find ways to bring light into the building and make the interior operations of the facility more visible, the library’s assessment team is also working to make the many evaluative measures—longitudinal and otherwise—equally more visible to all.

Overall Conclusions from Cornell and Georgia Tech
When considering longitudinal assessment for your library spaces:

• **Start where you are.** You are probably already collecting data such as gate counts, circulation statistics, and reference transactions. Start small when planning for longitudinal studies. At your local unit level you can do something without it being a large institutional survey if you just think about what to track over time and where and then use that to guide assessment. Even basic efforts have value since without cross-comparable data it is very difficult to draw larger conclusions.
• **Being proactive is better than being reactive.** Deciding in advance what your research questions are and what data you want to track helps you to have the data when you need it and prevents you from making a hasty decision that you may regret for years to come. But do not be afraid to pilot and revise or drop measures that are no longer useful.
• **Use the right tool at the right time.** Consider whether a longitudinal assessment is necessary at all or whether a short-term study will do (for example, general space usage versus specific furniture studies). Check to see if you can get longitudinal data from elsewhere. If you are collecting your own, pay attention to data collection and management and consider your data management plan in advance. It can be as simple as Mann’s box folder and wiki or more complex like Georgia Tech’s statistics dashboard. Prevent inconsistencies in data collection by creating standard methodologies.
and training your students and staff in research methods and data information literacy.

- **Engage stakeholders and partners.** Involve classes and students and work to build partnerships across campus. Doing this helps to create buy-in from stakeholders and develops a connection to the library that students may not have thought possible. Share and communicate your data widely and transparently and use it to support future programming decisions, tell your data story, and enable future use by others.

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**Endnotes**

So What? The Results and Impact of a Decade of IMLS-Funded Information Literacy Assessments

Carolyn Radcliff
Chapman University, USA

Megan Oakleaf
Syracuse University, USA

Michele Van Hoeck
California State University Maritime, USA

Abstract
The Institute of Museum and Library Services (IMLS) has funded three major information literacy projects. This paper describes the projects and addresses these questions: What difference have those expenditures made? What more do we know about student information literacy? About assessment of information literacy? The projects are:

• Project SAILS—The Standardized Assessment of Information Literacy Skills
• RAILS—Rubric Assessment of Information Literacy Skills
• PIL—Project Information Literacy

A. Project SAILS: Standardized Assessment of Information Literacy Skills
Carolyn Radcliff, Chair of Public Services, Chapman University

Project SAILS is a collaborative project offering a standardized test of information literacy knowledge. Begun in 2001, Project SAILS received substantial backing from several organizations, including a $252,000 National Leadership Grant from the Institute of Museum and Library Services and $50,000 from the Ohio Board of Regents. Kent State University, the Association of Research Libraries, and dozens of academic libraries in the US and Canada provided additional support.1 External funding was used throughout the four-year development phase for: development of a test item bank; expertise in measurement and programming; project staff and students; workshops; fellowships; and promotion and marketing.

The SAILS item bank has 155 multiple-choice questions based directly on objectives and outcomes in the ACRL Information Literacy Competency Standards for Higher Education (see the Project SAILS website for details—http://www.projectsails.org). Four of the five ACRL standards are covered. Multiple-choice was chosen as the form of assessment because it is a well-established testing method and is an efficient way to cover a large construct like information literacy. Well-written multiple-choice items are versatile and assess at both lower-order and higher-order levels.2

Project SAILS uses the item bank in two information literacy assessments, one that gives scores for cohorts or groups of students, and one that gives a score for each student. More than 160,000 students have taken a SAILS assessment. In spring 2014, the three-year benchmark for the SAILS cohort test has data from 61,099 students at 76 institutions.

Item reliability estimates for the cohort test are greater than .80. Validity was established by comparing SAILS scores with student SAT/ACT scores and with student scores on the Information Literacy Test developed at James Madison University.3 Details can be found on the Project SAILS website.4
The cohort test is given to a group of students, with each student answering 45 randomly selected items from the item bank. The cohort test gives results for the ACRL standards and for eight SAILS skill sets, which were created by regrouping the ACRL objectives and outcomes. The report presents results for groups of students, including results by class standing, major, and optional custom questions, plus benchmark comparisons with groups of institutions. Table 1 shows overall information literacy scores for class standing by institution type, based on the three-year benchmark. The score is given along with the standard error, indicated with ±. Standard error is the combination of sampling error and measurement error.

### TABLE 1: Project SAILS Cohort Test Overall Information Literacy Scores—2014

<table>
<thead>
<tr>
<th>Class</th>
<th>Associates</th>
<th>Bachelors General</th>
<th>Bachelors Liberal Arts</th>
<th>Masters</th>
<th>Doctorate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>460 ± 5</td>
<td>469 ± 5</td>
<td>483 ± 4</td>
<td>485 ± 2</td>
<td>492 ± 2</td>
</tr>
<tr>
<td>Sophomore</td>
<td>491 ± 6</td>
<td>500 ± 12</td>
<td>505 ± 7</td>
<td>506 ± 4</td>
<td>506 ± 8</td>
</tr>
<tr>
<td>Junior</td>
<td>503 ± 18</td>
<td>512 ± 8</td>
<td>513 ± 4</td>
<td>516 ± 9</td>
<td></td>
</tr>
<tr>
<td>Senior</td>
<td>511 ± 15</td>
<td>529 ± 7</td>
<td>525 ± 5</td>
<td>539 ± 7</td>
<td></td>
</tr>
</tbody>
</table>

As you can see, information literacy scores go up as students progress through college. The institution type showing the highest performance is doctorate-granting institutions.

SAILS cohort test results are reported for each of eight skill sets, as mentioned above. The skill set scores are not directly comparable to each other. Instead, we can compare institution types and class standing on each skill set. The table below displays the scores on each of the eight SAILS skill sets. The score is given along with the standard error, indicated with ±.

### TABLE 2: Project SAILS Cohort Test Scores on the Skill Sets—2014

<table>
<thead>
<tr>
<th>Skill Set</th>
<th>Associates (n=11)</th>
<th>Bachelors—General (n=12)</th>
<th>Bachelors—Liberal Arts (n=17)</th>
<th>Masters (n=20)</th>
<th>Doctorate (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing a Research Strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>452 ±3</td>
<td>486 ±2</td>
<td>505 ±2</td>
<td>499 ±1</td>
<td>497 ±1</td>
</tr>
<tr>
<td>Sophomore</td>
<td>486 ±3</td>
<td>508 ±2</td>
<td>507 ±3</td>
<td>502 ±2</td>
<td>509 ±4</td>
</tr>
<tr>
<td>Junior</td>
<td>513 ±2</td>
<td>512 ±3</td>
<td>525 ±2</td>
<td>518 ±4</td>
<td></td>
</tr>
<tr>
<td>Senior</td>
<td>518 ±1</td>
<td>541 ±2</td>
<td>527 ±2</td>
<td>530 ±3</td>
<td></td>
</tr>
<tr>
<td>Selecting Finding Tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>449 ±3</td>
<td>482 ±2</td>
<td>509 ±2</td>
<td>502 ±1</td>
<td>499 ±1</td>
</tr>
<tr>
<td>Sophomore</td>
<td>479 ±4</td>
<td>501 ±3</td>
<td>512 ±4</td>
<td>501 ±3</td>
<td>517 ±5</td>
</tr>
<tr>
<td>Junior</td>
<td>516 ±3</td>
<td>514 ±4</td>
<td>521 ±2</td>
<td>522 ±5</td>
<td></td>
</tr>
<tr>
<td>Senior</td>
<td>515 ±2</td>
<td>543 ±3</td>
<td>527 ±2</td>
<td>538 ±4</td>
<td></td>
</tr>
<tr>
<td>Searching</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>438 ±3</td>
<td>469 ±2</td>
<td>487 ±2</td>
<td>478 ±1</td>
<td>480 ±1</td>
</tr>
<tr>
<td>Sophomore</td>
<td>461 ±3</td>
<td>488 ±2</td>
<td>482 ±3</td>
<td>476 ±2</td>
<td>490 ±4</td>
</tr>
</tbody>
</table>
### TABLE 2: Project SAILS Cohort Test Scores on the Skill Sets—2014

<table>
<thead>
<tr>
<th>Skill Set</th>
<th>Associates (n=11)</th>
<th>Bachelors—General (n=12)</th>
<th>Bachelors—Liberal Arts (n=17)</th>
<th>Masters (n=20)</th>
<th>Doctorate (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Finding Tool Features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>487 ±4</td>
<td>517 ±2</td>
<td>529 ±3</td>
<td>524 ±1</td>
<td>523 ±2</td>
</tr>
<tr>
<td>Sophomore</td>
<td>511 ±5</td>
<td>536 ±3</td>
<td>534 ±5</td>
<td>528 ±3</td>
<td>535 ±6</td>
</tr>
<tr>
<td>Junior</td>
<td>544 ±3</td>
<td>538 ±5</td>
<td>544 ±3</td>
<td>554 ±3</td>
<td>558 ±6</td>
</tr>
<tr>
<td>Senior</td>
<td>545 ±2</td>
<td>569 ±3</td>
<td>551 ±3</td>
<td>562 ±4</td>
<td></td>
</tr>
<tr>
<td>Retrieving Sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>452 ±4</td>
<td>496 ±2</td>
<td>519 ±3</td>
<td>502 ±1</td>
<td>504 ±2</td>
</tr>
<tr>
<td>Sophomore</td>
<td>491 ±5</td>
<td>524 ±3</td>
<td>534 ±4</td>
<td>518 ±3</td>
<td>522 ±6</td>
</tr>
<tr>
<td>Junior</td>
<td>531 ±3</td>
<td>545 ±5</td>
<td>540 ±3</td>
<td>554 ±3</td>
<td>552 ±6</td>
</tr>
<tr>
<td>Senior</td>
<td>536 ±2</td>
<td>579 ±4</td>
<td>558 ±3</td>
<td>564 ±4</td>
<td></td>
</tr>
<tr>
<td>Evaluating Sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>432 ±3</td>
<td>460 ±2</td>
<td>473 ±2</td>
<td>473 ±1</td>
<td>471 ±1</td>
</tr>
<tr>
<td>Sophomore</td>
<td>453 ±4</td>
<td>479 ±3</td>
<td>468 ±4</td>
<td>472 ±3</td>
<td>479 ±5</td>
</tr>
<tr>
<td>Junior</td>
<td>484 ±3</td>
<td>479 ±4</td>
<td>496 ±2</td>
<td>496 ±2</td>
<td>498 ±5</td>
</tr>
<tr>
<td>Senior</td>
<td>491 ±2</td>
<td>510 ±3</td>
<td>504 ±2</td>
<td>507 ±3</td>
<td></td>
</tr>
<tr>
<td>Documenting Sources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>412 ±4</td>
<td>428 ±2</td>
<td>464 ±3</td>
<td>455 ±1</td>
<td>465 ±2</td>
</tr>
<tr>
<td>Sophomore</td>
<td>433 ±5</td>
<td>463 ±3</td>
<td>473 ±5</td>
<td>465 ±3</td>
<td>481 ±6</td>
</tr>
<tr>
<td>Junior</td>
<td>471 ±3</td>
<td>488 ±6</td>
<td>497 ±3</td>
<td>495 ±7</td>
<td></td>
</tr>
<tr>
<td>Senior</td>
<td>479 ±2</td>
<td>548 ±4</td>
<td>505 ±3</td>
<td>528 ±4</td>
<td></td>
</tr>
<tr>
<td>Understanding Economic, Legal, and Social Issues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>408 ±3</td>
<td>451 ±2</td>
<td>462 ±2</td>
<td>458 ±1</td>
<td>459 ±1</td>
</tr>
<tr>
<td>Sophomore</td>
<td>444 ±4</td>
<td>471 ±3</td>
<td>458 ±4</td>
<td>463 ±3</td>
<td>465 ±5</td>
</tr>
<tr>
<td>Junior</td>
<td>468 ±3</td>
<td>471 ±4</td>
<td>487 ±2</td>
<td>487 ±2</td>
<td>481 ±5</td>
</tr>
<tr>
<td>Senior</td>
<td>475 ±2</td>
<td>505 ±3</td>
<td>492 ±2</td>
<td>492 ±2</td>
<td>498 ±3</td>
</tr>
</tbody>
</table>

The data show that seniors do better on the test than freshmen. This is true for every skill set and for all four types of schools that have seniors. Differences range from an increase of 24 points to an increase of 84 points. Seniors also perform better than sophomores for all skill sets and all school types except understanding economic, legal, and social issues at bachelors—general institutions. Seniors outperform juniors in most instances. For associates schools, sophomores do better than freshmen on every skill set, with increases ranging from 21 to 39 points. The biggest gains are mostly in two skill sets, retrieving sources and documenting sources.
Taking the standard error into account, we can see which types of institutions perform better on the skill sets. Liberal arts schools had the most instances of having the highest score alone (see for example, freshmen on the first skill set, developing a research strategy) and having the highest score along with another institution type (for example, on the second skill set, selecting finding tools, sophomores at both liberal arts institutions and doctorate institutions scored equivalently).

In nearly all skill sets at nearly all levels, doctorate, masters, and bachelors—liberal arts schools scored higher than bachelor—general and associates schools. Students at liberal arts institutions scored consistently higher in the skill sets of developing a research strategy; searching; and retrieving sources.

As with all assessments, interpretation of results should occur within local context and environment. We expect to see the progression from freshmen to seniors, which leads to the question of how students are learning these skills. The SAILS test itself gives no information about how the learning occurs. Is it library instruction? Predictable student development and maturation? Learning from classroom faculty? Assignments? Parents? Friends? Trial and error? Without knowing more about the testing situation and the institutional environments, we cannot answer these questions on a large scale. An institution that uses the Project SAILS assessments benefits from a careful and context-based interpretation of their results.

Two articles describe the use of the SAILS tests in more detail. Rumble and Noe describe the implementation of SAILS at Auburn University and subsequent successful collaboration with university stakeholders. Along with the Collegiate Learning Assessment, surveys and interviews, and anecdotal evidence, SAILS was a key factor in a major restructuring of a freshman composition course with a focus on information literacy skills. Lym, Grossman, Yannotta and Talih present results of a survey of SAILS participants with a focus on how institutions were able to make use of the SAILS results. The authors summarize the implication of their study as follows: “Results from this study suggest that SAILS can be most effective if there is statistical/institutional research support for data analysis, if the sampling method for selecting test takers is more rigorous, if SAILS is used in conjunction with other instruments, and if the SAILS data is correlated with other institutional data.”

Caveats
It is important to note that the SAILS benchmark is not necessarily representative of college students in general. Institutions that participate in SAILS are self-selecting. In addition, each institution selects students to take the SAILS test and those students may not represent the institution’s student body. The assessment is almost always low-stakes, in that a student’s performance is not tied to any outcome, such as a grade, that would affect that student’s college career. Low-stakes tests may result in low motivation to perform well and consequently the results may under-report students’ information literacy.

The SAILS tests provide just one perspective on information literacy levels of undergraduate students. The tests measure knowledge, which does not always correspond to demonstration of information literacy skills. Finally, the tests are based on the very broad construct of information literacy as operationalized by four of the five ACRL standards.

Conclusion
The SAILS assessments have provided an important tool for institutions that want to measure students’ information literacy. As the profession moves to a new approach for defining and understanding information literacy, developers of the SAILS tests are working toward
a next generation assessment tool that marries the benefits of standardized testing with the sophisticated and multidimensional aspects of the Framework for Information Literacy in Higher Education. More information can be found at https://thresholdachievement.com.

Notes


B. RAILS – Rubric Assessment of Information Literacy Skills
Megan Oakleaf, Syracuse University

RAILS was an IMLS-funded early career research project focused on supplying timely and practical assistance to academic librarians seeking to address one of their most important needs: the authentic assessment of information literacy learning. Information literacy is a complex construct that is best assessed via contextualized artifacts of student learning, and rubrics make these assessments faster and less open to charges of subjectivity. Through RAILS, hundreds of librarians and pre-service library students created and deployed more than 150 rubrics and supported the learning of thousands of students in academia and K–12 education. Furthermore, RAILS engaged and educated librarians, faculty, and assessment professionals in rubric “norming” as well as developing new strategies to improve norming effectiveness; led the way in rubric interrater reliability analysis by rigorously analyzing the appropriateness of three separate measures; and provided evidence of “what works” and “what doesn’t” in rubric language and construction practices. In sum, RAILS advanced the authentic and artifact-based assessment of student learning in higher education.

Research Project Phases and Cycles
The research portion of the RAILS project included five phases and two iterations of the assessment cycle. Cycle 1 included Phases 1–5; Cycle 2 repeated Phases 2–5, integrating lessons learned and revised materials developed in Cycle 1. Over two cycles, 10 lead librarians were trained in rubric and norming techniques, 100 faculty/librarians participated in rubric assessment, and 1000 student work samples were assessed and statistically analyzed.
### Phase 1
PI and librarians developed drafts of rubrics to assess information literacy outcomes using ACRL and AAC&U materials as a starting point. All rubrics are available on the RAILS website and they serve as inspiration to librarians creating their own rubrics. The RAILS website facilitated this process by providing functionality for 300+ site members to copy and adapt rubrics easily.

### Phase 2
Academic librarians selected one rubric to adapt and test on their campus. PI trained librarians to solicit student work samples, recruit raters, “norm” rater on rubrics, and apply rubrics to student work at their home institution. Training occurred after the close of the 2010 and 2011 Assessment Immersion programs offered by ACRL.

### Phase 3
Librarians returned to their home institutions, solicited student work samples, recruited librarians/faculty to participate in rubric norming and rating of student work samples. PI traveled to each institution to teach librarians to train raters, support rubric scoring, and survey all participants.

### Phase 4
PI analyzed data. Aggregated data describing student learning was returned to each librarian’s institution. PI examined surveys to uncover potential barriers to rubric use.

### Phase 5
Librarians completed Closing the Loop Surveys designed to 1) determine what instructional improvements resulted from their institution’s rubric assessment data and 2) gather evidence of increased student learning. PI disseminated assessment results and revised training materials via the RAILS website, conference presentations, publications, and LIS course content (including two core courses at Syracuse University and a WISE consortium course). The RAILS website includes more than 120 rubrics, reading lists, training materials, 16 press releases, 14 presentations, 2 articles, and many detailed statistical reports. Because RAILS continues to be of interest to the profession, the dissemination work is ongoing.

### Research Results
RAILS set out to address several research outcomes and impacts. Outcomes included goals such as: developing and disseminating rubrics to be used/adapted by librarians and faculty to assess information literacy learning outcomes; developing and disseminating training materials to prepare librarians and faculty to apply rubrics; developing a data analysis model for rubric assessment to ensure valid and reliable results; and collecting and sharing information about the use of rubric assessment data to improve information literacy instruction and increase student learning.

RAILS also sought to create a number of impacts, including:

- Academic librarians will gain useful, generalizable tools that can be customized for local needs and be prepared to demonstrate the value of academic libraries, respond to calls for accountability, participate in accreditation processes, strengthen instructional programs, and improve student learning—both alone and in collaboration with faculty.
- Students participating in information literacy instruction in institutions of higher education will demonstrate increased learning due to improved instructional programs.
- Academic libraries will produce more reliable, valid, and descriptive data about their contributions to learning. As a result, they will adopt evidence-based decision making,
reflective practice, and cultures of assessment; respond to calls for accountability with confidence; improve instruction to students; increase student learning; and serve as role models on their campuses.

The results of RAILS research are voluminous. Full institutional reports and additional aggregated data are available online at http://railsontrack.info/results.aspx. Each institutional report includes information describing how students at that institution performed on information literacy outcomes as revealed by authentic performance assessments; how librarian and faculty raters scored those assessments; the degree to which raters agreed (or not); and the degree to which the rubrics functioned to capture student learning reliability (or not). Among other findings, RAILS revealed that:

• Student learning artifacts that are concrete, focused, and not overly long appear to provide reliable rubric assessment results. Examples include: reflective writing or “think alouds,” open-ended question responses, posters, worksheets (including concept maps and citation maps), etc.
• Inclusion of “wiggle” words (words, typically adjectives and adverbs, that are open to subjective interpretation) in rubric language appears to lead to unreliable rubric assessment results. Examples include: fully/partially, appropriate/inappropriate, some/many, etc.
• Raters enjoy “norming,” the process in which they discuss—and attempt to come to consensus—on how to use a rubric to score student learning artifacts. This appears to be true whether or not an individual rater is able to align their scores of student artifacts with other raters. In other words, the skill of a rubric rater does not appear to impact their enjoyment of the rubric norming process; both “good” and “bad” raters value and revel in conversations with colleagues about learning outcomes, student artifacts, and rubric content.
• Writing reliable rubrics to assess information literacy learning is challenging. Even armed with numerous models and extensive professional experience, librarians find it challenging to clearly and precisely articulate exactly what hallmarks, indicators, or other signs they expect to 1) find in student artifacts and 2) use to judge the degree to which students have achieved a particular information literacy outcome.
• Three statistical measures can help librarians evaluate the quality of a rubric and identify areas in which a rubric requires improvement; they include Pearson’s correlation (rho), Cohen’s kappa, and Krippendorff’s alpha. Of the three, Pearson’s correlation tends to be overinflated (indicating better reliability than actually exists). While Cohen’s kappa is effective, it may also be overly strict. Current research appears to indicate that Krippendorff’s alpha is best suited for information literacy rubric assessments like those investigated as a part of the RAILS project. More information can be found at http://railsontrack.info/media/documents/2014/7/rails1013irr.pdf.
• A variety of challenges can thwart rubric use. Among the most predominant obstacles are: too little time, too few assessment support structures, too few rewards associated with rubric assessment, and lack of familiarity with rubrics in general. More information can be found at http://railsontrack.info/media/documents/2014/8/colleaguebarriers.pdf and http://railsontrack.info/media/documents/2014/8/individualbarriers.pdf.
• Despite the challenges associated with rubric assessment, rubric use leads to improvements in teaching strategies, future assessment efforts, librarian-faculty collaboration, and student learning. More information can be found at http://railsontrack.info/media/documents/2012/7/Closing_the_Loop_2012.pdf.

While the RAILS project has produced helpful results and important impacts, additional investigations of rubric approaches to information literacy assessment are merited. Future researchers might further explore rigorous statistical measures to judge rubric quality, expand lists of rubric best practices, and determine the characteristics of effective rubric raters. As information literacy assessment efforts trend inexorably toward the inclusion of more performance assessment approaches, any and all investigations of effective rubric use are welcome and necessary!
C. Project Information Literacy: Contributions to the Assessment of Student Learning
Michele Van Hoeck, Research Associate, PIL, and Interim Library Dean, California State University Maritime

Introduction
As the instruction coordinator at the Cal Maritime Library, I have been focused on assessment of student learning in information literacy. Our library has relied on both SAILS and rubric-based assessment of student work to improve our instruction program. I see Project Information Literacy’s research as complementary to the SAILS and RAILS, providing invaluable data on the student perspective regarding information literacy.

Project Information Literacy (PIL) is a large-scale study about early adults and their research habits. PIL has produced several studies since 2008, qualitative and quantitative studies usually focused on undergraduates. The focus of this paper is two recent PIL studies that moved off-campus to focus on recent college graduates. Both of these studies were funded by IMLS. They are (1) the 2012 workplace study, which was funded with a small IMLS planning grant, and (2) the larger, ongoing lifelong learning study of 2014–2015, which is being funded by a $470,000 leadership grant.

Methods
The 2012 workplace study was conducted in two parts, both qualitative: employer interviews (n=23) and focus groups with college graduates from four institutions (n=33). The 2014–2015 lifelong learning study will also consist of two parts: spring 2014 interviews with college graduates from ten institutions (n=63) and a large-scale online survey of college graduates from the same ten institutions, to be distributed in fall 2014.

Why should academic librarians care about workplace information literacy or lifelong learning practices of college graduates?
A quick calculation on Bureau of Labor Statistics data shows about 1% of the labor force in the United States works in academia. Furthermore, a typical college graduate will only spend about 5% of his or her life on a college campus. The vast majority of the students we work with will apply whatever they learn in the way of information literacy in a nonacademic environment.

In the recent IMLS-funded studies, PIL sought to understand college graduates’ information seeking and using practices and challenges after they leave the world of academia. This research examined their information competencies and their gaps in competency. The researchers at PIL believe this is useful information for everyone teaching and leading within academia. You could even say this post-graduate data provides the ultimate assessment of student learning.

Findings: 2012 Workplace Study
One question posed in focus groups related to what aspects of doing research in college had transferred well to the workplace. Graduates we spoke to valued having learned to:
1. Evaluate sources
2. Critically read and analyze published sources
3. Synthesize large volumes of content

These competencies were similar to those ranked as “most difficult” by freshmen students in a 2012–2013 PIL study:
1. Filtering and sorting relevant sources
2. Summarizing and integrating different sources
3. Reading and comprehending sources
Regarding competency gaps among college graduates in the workplace, employers identified the following optimal, but lacking, workplace research skills, listed here in order of response frequency:

1. Engaging other team members in the research process
2. Retrieving information using a variety of different formats
3. Finding patterns and making connections
4. Exploring a topic thoroughly—imagining all of the answers

The most common observation by employers regarding recent graduates’ difficulties involved the social nature of workplace research. This aspect surfaced in employer interviews in two ways: the use of people (experts) as sources, as well as the iterative nature of information gathering, in which team members conferred with each other throughout the research process.

During focus groups with recent graduates, this social side of research was one of three top challenges mentioned, a notable area of overlap with the employer perspective. In describing workplace research difficulties, one graduate said, “The biggest hurdle for me was getting used to talking to strangers.” A typical employer comment on recent graduates was, “They need to look beyond their computer screens” when gathering information at work.

This finding echoes an extensive body of research on “communities of practice,” a term coined in 1991 in an anthropological study by Jean Lave and Etienne Wenger. “Communities of practice” has become a well-accepted paradigm for how people learn at work, particularly how newcomers learn from more experienced colleagues.

I’d like to conclude with some questions for reflecting on how we can better prepare undergraduates for workplace information environments. How are team projects in college different from communities of practice? There are most likely important differences in expertise levels, status, and participation of team members. What role do “people as sources” play in academic research? Formal and informal consultation with experts may be an underutilized practice in the undergraduate curriculum. Finally, how do we conceptualize student work when we plan library services, spaces, and instruction?

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Notes
What vision do America’s academic library leaders have for their institutions? How would they allocate their budgets if more funds were made available to them? How aligned do they perceive themselves to be with their colleges and universities, and with their immediate supervisors? What impediments do they face in their efforts to drive change? In this presentation, Roger Schonfeld addresses these questions with a snapshot of American academic library leadership from the Ithaka S+R Library Survey 2013. He emphasizes issues of special interest to the library assessment community, including findings on the extent to which library leaders are using techniques of data and assessment to support their planning and the value they see in doing so. The Library Survey 2013 had 499 responses from library deans and directors, or 33% of the population surveyed, allowing for robust analysis by institution type and other stratifications. It offers comparisons against the Library Survey 2010 on many key questions, permitting an analysis of how the views of this group have evolved over the past three years. In comparative analysis with the Ithaka S+R US Faculty Survey 2012, this presentation also examines the degree of alignment, or mismatch, between library leaders and faculty members. This presentation is designed to spur a discussion about how assessment librarians institutionally and the assessment librarian community collectively can support the needs of library leaders as they attempt to identify and lead appropriate directions for their libraries.

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Creating and Implementing a Liaison Assessment Program

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Introduction
Liaison librarians are responsible for a wide range of activities and new responsibilities in the modern research university library. A recent publication by Jaguszewski and Williams for the Association of Research Libraries discusses how liaison roles are changing in research libraries:

In the past, libraries focused largely on capturing the end products of scholarship, and the bibliographer model was designed to fulfill that goal. Then, the liaison model evolved, recognizing the need for advanced library research assistance within the disciplines and instruction in general library research processes for students. With increasing pressure on researchers to plan and manage their output, and a growing adoption of open access publishing, research libraries are now compelled to understand and support all processes of instruction and scholarship, which calls for an engagement model. An engaged liaison seeks to enhance scholar productivity, to empower learners, and to participate in the entire lifecycle of the research, teaching, and learning process.

It is within this changing context and evolving roles for liaison librarians that we instituted two internal task forces at two different research universities to examine these areas of responsibility, some existing and some new, and to develop a framework for assessment and ongoing professional development for liaison librarians.

The first task force, in existence from 2009–2011, was chaired by Daniel C. Mack, then head of the arts and humanities library at Pennsylvania State University, and resulted in a framework for core competencies in five broad areas of responsibility. The second task force at the University of Maryland used much of this previous work, but refined the core competencies to meet the environment at the University of Maryland and also to develop an assessment and professional development plan. This task force was charged in late 2012, completed its final work in 2013, and is currently implementing the plan as discussed later in this paper.

Core Competency and Assessment Framework
Both task forces identified five broad areas of responsibility for liaison librarians:
1. Collections content and access
2. Reference and research consulting and mentoring
3. Teaching, learning, and literacies
4. Engagement and outreach with the university and beyond
5. Scholarly communications and information technology

Each of these five categories includes a substantial list of core competencies to illustrate existing and emerging areas of responsibility. Below is a brief discussion of the priorities and of suggested assessment activities and tools in each of these categories. It is important to note that the work of the task forces included seeking broad input from all liaisons individually and through several open forums.

Collections Content and Access
The guidelines at the University of Maryland state: “Subject specialist liaison librarians at the University of Maryland Libraries develop, manage, and facilitate access to collections in all formats and media to support both undergraduate education and advanced research in their assigned academic units. Subject specialist liaison librarians actively engage with library users as we transition to the digital library while continuing to provide outstanding support for unique materials in all physical formats. Librarians also collaborate with information professionals in other disciplinary areas, at other institutions, and
within professional associations and consortia to create interdisciplinary collections supporting the curriculum and research agenda of the University of Maryland College Park, the citizens of Maryland, and the international community of scholars.”

Assessment for collection development must include liaison activities that go beyond the traditional evaluation of collection content. Rather, such assessment must also include the collection development work that liaisons perform in conjunction with their other work in engagement, outreach, teaching and consultation. It should also cover activities that include trends in publishing, document delivery and distribution, duplication across formats, and physical collections space. Liaison librarians should assess fiscal basics, such as proper spending of collections accounts and meeting fiscal deadlines. Librarians must also evaluate the content of collections based on current subject-specific collection development policies that support the institution’s curriculum and research enterprise. This might also include specific assessment activities such as review of serials and database subscriptions and of approval plans. Finally, liaison librarians should monitor databases, interlibrary loan requests, and course reserves to determine trends in content need and document any special projects involving the weeding material or identifying material for remote storage.

Reference and Research Consulting and Mentoring
The guidelines at the University of Maryland state: “The subject specialist liaison librarians actively engage and participate in providing services to students, faculty, and outside researchers to explore in-depth research in the area of their expertise. The subject specialist liaison librarian is a resource for both faculty and students in their assigned academic units, as well as other researchers needing assistance with library resources. The subject specialist liaison librarian acts as guide and mentor for advanced and specialized reference and research needs.”

Many of the fundamental activities in research and reference consulting and mentoring are more traditional types of services, such as one-on-one research assistance or participating in shared reference services, both physical and virtual. The guidelines also specify that librarians need to participate in workshops, training, and conferences to keep abreast of new trends and issues, and to also keep up with new technologies that enable excellent reference and research consulting practices. Much of the new content in this category is specifically related to data collection and assessment. Specifically, the framework calls for all liaison librarians to maintain and submit regular statistics for in person and virtual interactions, and to use adopted technologies for data gathering and dissemination; to analyze the types of questions received; to collect and analyze qualitative feedback from library users; to use statistics and usability assessment techniques for analyzing the effectiveness of reference websites, research guides, and other web-based tools; to regularly gather qualitative feedback from faculty members in assigned departments; and to participate in LibQUAL+® or other broad assessment programs.

Teaching, Learning and Literacies
The guidelines at the University of Maryland state: “Subject specialist liaison librarians at the University of Maryland Libraries engage in instructional activities that could be face-to-face, online instruction, or blended classes in areas of their specialty, as well as in general, core, and other courses such as the Professional Writing Program (PWP), Gemstone, and College Park Scholars. Liaison librarians offer training for databases, research tools, bibliographic management programs, and in other areas to support education and research. Librarians collaborate with instructors to integrate library instruction into the curriculum, as well as into the educational and research environment of the University of Maryland.”

Assessment of teaching and other instructional and learning activities is fundamental as colleges and universities place a greater emphasis on the importance of assessment of impact in these areas. In addition to gathering quantitative data on the number of courses/number of students taught, the assessment framework also asks that liaison librarians regularly encourage and participate in peer assessment of teaching and to develop new instruments that faculty and students can use to evaluate the effectiveness of library instruction. The framework also provides guidance for how liaisons can proactively target specific courses to offer instruction, and to work with new faculty to
promote how liaisons can enhance student learning in individual courses.

**Engagement and Outreach**
The guidelines at the University of Maryland state: "Subject specialist liaison librarians actively participate in the intellectual life of their assigned academic units. They support the success of the research and public programs, department projects, galleries, and research centers of their assigned units. Subject specialist liaison librarians engage with faculty and students as colleagues and as mentors in disciplinary activities. Librarians keep their assigned academic units updated about the libraries' facilities and services. They engage in fundraising and development activities to the benefit of the libraries and their assigned units. Librarians collaborate with assigned units in programming and outreach activities. They participate in outreach to the libraries, to the university, to the community, and to the profession in development and fundraising, strategic planning, diversity initiatives, operations, faculty governance, and other areas of service."

Important activities that should be assessed include evidence of regular communications with department heads, program and school directors, honors and graduate officers, prominent faculty, and new faculty members. It is also critical that liaisons proactively engage in the academic life of the departments to which they are assigned, including participating in relevant departmental meetings and programs, and to participate in strategic planning and other planning activities.

**Scholarly Communications and Information Technology**
The guidelines at the University of Maryland state: “Subject specialist liaison librarians at the University of Maryland form vigorous, sustainable, and long-term relationships with research faculty. They are recognized for their advanced subject knowledge and expertise in information policy, author and intellectual property rights, and a suite of research skills, such as data mining, curation, and management customized specifically for their academic specialty. Liaisons collaborate fully with faculty on complex research projects, including citation management, data creation and preservation, usage rights, and assisting with distribution of finished works and raw data by promoting open access and local, domain, or national repositories. Subject specialist liaison librarians are consulted on their expert knowledge of the publishing industry and the scholarly communications cycle by faculty in editorial development and production and in impact metrics for tenure and promotion review. Subject specialist liaison librarians actively assist in building the university’s institutional repository. Librarians also provide project consultation on all aspects of data management and long-term data curation. Librarians connect faculty to relevant services and resources across the campus, as well as regional and disciplinary data repositories for long-term archiving."

In assessing projects and activities relating to scholarly communications and information technology, liaison librarians must be familiar with both their library’s initiatives with digitization, stewardship, and curation of content in all formats, digital publishing, open access, and copyright issues. Individual librarians may be involved in specific digital projects, which as a matter of course should incorporate specific assessment measures including assessment of the librarian’s role in the project. One emerging key area in this rubric is evaluation of activities relating impact factors, including altmetrics, for both librarians and for collegiate faculty. Because scholarly communications and information technology issues might be the areas with which liaison librarians are least familiar, they should consider devising specific tools and projects for gathering both data and qualitative assessment. These could include development of surveys, use of focus groups, and other means of evaluating both current undertakings and future needs of faculty, graduate students, and other relevant constituencies.

**New Liaison and Continuing Liaison Checklists**
One tool that can be particularly effective for liaison librarians in developing a comprehensive program of assessment is the development of checklists. Two are especially useful: a checklist for new liaison librarians, and a continuing liaison checklist that can serve as a “tickler file” for routine and regularly scheduled activities. Liaison librarians can easily customize such checklists in consultation with their supervisors and in keeping with departmental and institutional strategic priorities. These can be as simple as text documents that librarians can physically check off, or can...
reside online in any enterprise system or free web-based application, such as Evernote, that provides the necessary functionality.

The new liaison checklist can be an important training and professional development tool for librarians who are new to serving as liaison to an academic department or program. While every library will have specific activities, some of the general activities to incorporate into the new liaison checklist include:

- Meet with department chairs, program directors, graduate and honors officers, and other key personnel in assigned academic units to learn about departmental needs, wants, and expectations from the library.
- Meet with college library committees, if applicable.
- Survey, meet or confer with faculty in liaison departments and programs; if the number of faculty is too large to meet with all, identify a few key senior faculty, faculty who have recently received tenure, and new faculty to get a cross sample.
- Survey, meet, or confer with faculty, research personnel, and graduate students in affiliated institutes or research centers.
- Attend lectures and other programs conducted by liaison departments and programs.

The continuing liaison checklist is likewise a useful instrument by which more established librarians could keep abreast of more recent developments in their liaison departments, as well as keep track of routine liaison duties. Activities for a continuing liaison checklist include:

- Meet with new collegiate faculty, postdocs, researchers, and graduate students in liaison departments.
- Meet with candidates who interview for faculty, postdoctoral, or graduate student positions in liaison departments.
- Volunteer to serve on faculty committees in liaison departments and programs.
- Teach credit courses for liaison departments, if asked and qualified.
- Volunteer for departmental or college open houses, student research fairs, or other outreach programs.
- Volunteer expertise as applicable.
- Meet regularly with collegiate faculty individually and in departmental meetings.
- Conduct workshops on subject specific databases and other resources that may be of interest to the department’s research or teaching.
- Keep up to date with trends in higher education and specific disciplines via Chronicle of Higher Education and other relevant publications.
- Assess faculty and student research tools and methodologies, and use results to shape collections and services.
- Collaborate with other subject specialist liaison librarians on interdisciplinary projects and assessment activities.

Faculty Interest Surveys
The faculty interest survey can be a powerful tool to determine the needs and expectations of liaison departments and programs. While the library may occasionally conduct an institution-wide survey of all faculty, especially in conjunction with a program such as LibQual or ITHAKA, individual liaison librarians can also benefit by regular, targeted surveying of collegiate faculty in the departments and programs they serve. Surveys can also include graduate and other students if relevant. The survey can focus on a specific topic or issue such as collections or instruction, or can more generally address library services across the board. It might be useful at times to permit faculty to submit feedback anonymously, but the survey should also offer the option of faculty being able to identify themselves so the liaison librarian can follow up on specific questions and issues. Many institutions offer software for designing and sending out a survey electronically. Librarians can also take advantage of the many free online tools, such as SurveyMonkey, to conduct web-based surveys. Some general questions for a survey include:

- Optional: faculty name, title, contact information, primary department, and additional departments and programs of affiliation
- Describe current areas of research
- Describe current teaching areas
- What information sources do you use regularly (databases, journals, etc.)?
- What formats and media are important to your research and teaching (print, online, microform, CD/DVD and other media, maps, music scores, etc.)?
- What library services do you regularly use (interlibrary loan, document delivery, course reserves, bibliographic instruction by librarian, etc.)?
What information sources and services would help your research and teaching that are not currently provided by the library?
• Have you noticed any specific information literacy gaps in your undergraduate or graduate student research projects?
• Are your graduate students getting the research support they require to be effective?

In addition to these general questions, the liaison librarian can personalize questions in the survey to acquire more specific, targeted information. These questions can include:
• I understand that you are an expert in discipline x; what are some of the emerging trends or issues that you see in this field?
• Does the library currently support your discipline sufficiently? If not, in what areas is the library lacking?
• What services should the library consider offering in order to meet your discipline’s future needs (data curation, grant writing assistance, statistical consulting, impact factor consulting, etc.)?

Implementation
After the Liaison Task Force completed its work in developing a framework for core competencies and assessment, it was important to approach implementation in a manner that would ensure success and buy-in. In order to do so, an overarching “Liaison Report Implementation Group” was formed, along with four implementation subgroups, each consisting of teams of liaisons. These four groups are: Formal Assessment Program Group; Training Program Group; Web Presence Group; and an Outreach Group. There was a considerable amount of angst about what this program would mean for individuals, especially in newer areas of responsibility. It was therefore imperative to constantly convey that this was an effort at continuous quality improvement of liaison services and that appropriate training and support would be provided in an ongoing manner in order to ensure success. The work of these four groups is ongoing but informal assessment of this structure indicates that the work is progressing and that liaison librarians are active participants.

The Formal Assessment Program Group was asked to review and develop clear expectations for the documentation of assessment, including types and frequency, under each of the five categories described above. Members were asked to include both quantitative and qualitative assessment when appropriate, and to also include formative assessment measures for junior librarians. The group was also asked to document environmental barriers that hinder liaison librarians’ abilities to perform certain tasks. Finally, the group was asked to create checklists for each rubric and for both junior and senior level librarians to facilitate tracking of required duties and assessment activities.

Acknowledging that there were training needs for many librarians in at least some of the categories, another group was charged to review existing training venues and to develop a formal training program for liaison librarians, including both training for new librarians and continuing professional development for senior librarians. The group was asked to design a training program that would initially emphasize new and emerging areas such as scholarly communication and outreach. Liaison librarians should be surveyed to determine areas of most need.

The Web Presence and Outreach Groups have overlapping purposes. The Web Presence Group is primarily focusing on creating greater visibility of subject specialist liaison librarians within the libraries’ web presence. The Outreach Group is charged with developing a program to recognize, publicize, and award the achievements of liaison librarians. This can be integrated with other libraries’ programs and will include creation of a web page that highlights key professional achievements of liaison librarians, including awards, honors, and national offices. It will also create a print and digital brochure for the liaison program, including the core competencies, assessment information, and librarian honors and awards.

Advice and Conclusions
Implementation of a new liaison program that outlines core competencies and that focuses on assessment is a delicate matter. Many of our liaisons were initially distrustful of this idea and felt that they might be held accountable for activities that they felt under-qualified to perform.
It is therefore imperative that those implementing such programs engage and include liaisons at the earliest stages and discuss this as a developmental process both for the organization and for individuals, and not something that is punitive. Publicly acknowledging these concerns and fears about changing roles and the impact that this new program will have, and to clearly articulate a commitment to work together positively and proactively will do much to ensure a smoother process. Broad inclusion of liaisons is therefore critical for buy-in and for success.

It is also important to acknowledge and support needed training and resource needs. In addition to the Training Program Group, described above, a liaison “toolbox” of resources is in development, and “communities of practice” for different activities are being encouraged that focus on peer-to-peer learning. To ensure that this is a program that will be broadly based, administrators have given a one year time period before these core competencies became part of official workplans for each liaison librarian. It is important to make these activities an official part of the annual review and workplan development process as it will better ensure that direct administrators and liaisons have a shared understanding of what is expected and an expectation that future evaluations will include addressing how well each liaison is meeting the core competencies outlined in this document.

Future work includes ongoing assessment, developing a method for periodically assessing the various components and updating the core competencies as needed, monitoring of national trends in assessment and implementation as necessary, and continuing to build a culture of assessment within our institution. By focusing on this framework and continuing to refine the activities in which our liaisons engage, we can ensure that our liaisons, and our libraries as a whole, continue to remain an active and critical part of the academic life of the colleges and departments that we support.

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Notes
I was asked earlier how I ended up being up here, so I thought I would share this with you. It’s a bit embarrassing, but since I told one trusted librarian who swore to secrecy, it’s only a matter of time before the rest of you know anyway. And Martha doesn’t know the whole story either, well, until now.

Martha called me a couple of weeks ago, and invited me to participate in this closing session and I instantly agreed. Well, I’m up in Canada and we had a poor connection, so I was not hearing every word clearly. Well, for those of you who don’t know me, I don’t readily agree to put myself up in front of a few hundred people to talk. So, let me explain why I did it. First of all, as you know, librarians aren’t considered to be the best dressed, and I tend to be the poster child for this. So, when Martha said closing session, I actually thought she said “clothing session” and I believed she was offering me a fashion intervention. So that’s why I agreed. I have not been to a library assessment conference and I heard this group is progressive, so I thought that makes sense. You can imagine my surprise and disappointment when I saw the program schedule and there was no mention of clothing. But no worries, I am delighted to be here.

As a lifelong longer it was a great opportunity to build my knowledge and extend my understanding in assessment. As a librarian, I took whatever information I received; I tend to supplement it and dig deeper with further research. I came here to learn, and learn I did.

For example, in our very first hour, Betsy Wilson, the vice-provost for digital initiatives and dean of the university libraries here at U of W, informed us that there are giant octopuses roaming the streets of Seattle. That really freaked me out by the way.

So I went online and quickly discovered that these giant octopuses can reach up to 135 kilograms, or for my American colleagues, 300 pounds, with an arm spread of 9.3 meters, and for my American friends, 32 feet. So, you can see how much I got out of the very first hour, and that was only the tip of the iceberg.

There are a number of experiences throughout this conference that have left a lasting impression on me which I’d like to share with you, and I’ve tried to organize my thoughts in three themes.

Four Cs…Community: (Collaboration, Communication, and Commiseration): Although there are approximately 600 participants, it still appears to be a manageable, and as one attendee mentioned, intimate community at least in terms of the 3 Cs. My experience at the breaks, meal times, receptions, and poster sessions, everyone appears to be most approachable and willing to share their knowledge and experiences, good and bad, regarding the conference. And of course, this closeness and support certainly extends beyond just this conference. When I first started my position just last fall and learned that assessment was part of my portfolio, I called ARL and asked for information about assessment. Well, I was put through to Martha, and an hour later, I had gained considerable knowledge about the resources, organizational structures, and communication vehicles—thanks to Martha. Since that time, we have made cold calls to more than a dozen individuals at other institutions requesting phone meetings to learn more about specific assessment
products and/or approaches, and every single individual was more than willing to give up an hour of their time to talk with us.

At this conference as well, I’ve had the opportunity to collaborate with many colleagues, communicate with them, share experiences, request and get information, and at times, commiserate—it’s been a great opportunity to network and become part of this very knowledge community interested in assessment. In fact, I asked a number of colleagues their impressions of the conference, and when I told them what it was for, they all decided it was best not to share but they did wish me well.

Perseverance, Courage, and Tenacity: Certainly these terms can be applied to the pioneers and gurus in our field...Martha, Steve, Jim, Megan, Margie, Debbie, and the list goes on of those who have helped created pathways for the rest of us. However, what I found most inspiring and motivating were the sessions by those like me, who don’t have the depth of knowledge or experience, yet, but are boldly challenging the status quo and in fact, blazing new trails and offering unique insights. Case in point, Carol Tenopir presented earlier this week, a great presentation, and at the end of the presentation when it was time for Q&A, a young lady approached the mike at the end, and asked Carol, have you and your researchers thought about this approach (and she went on to describe it)? Carol paused for a long moment, and said, actually, no we have not but perhaps we should—can you stop by after and talk to me about this? It is that kind of courage and willingness to put oneself out there which inspires me. And kudos to Carol for her willingness to consider new approaches and encouraging those to share their views. Through most of the sessions, my peers and colleagues talk about hitting roadblocks and challenges, and constraints, which we all experience. But you never heard anyone saying “it can’t be done, let’s forget about it”—everyone was focused on finding alternative solutions, using “close surrogates or substitutes for now,” describing work-arounds or different approaches to try to arrive at a useful solution. They celebrate the little victories or any progress along the way, which I think is important.

Baby Steps/First Steps...What’s Next?
I found this conference overwhelming with the breadth and depth of knowledge and information, and it could easily lead to paralysis by analysis when I get back and need to figure out how to move forward. But Megan suggested a way to address this.

I had the great opportunity to participate in her workshop on Sunday, and in a span of just a few hours, she shared more than 50 strategies and approaches to demonstrating value and ROI, and she left us with this warning: don’t try to do too much...pick one idea that is actionable on your return and move forward with it. So, I think that is great advice, particularly for those who are here for the first time, and certainly one that I am going to follow.

In conclusion, this conference is really a tribute and recognition of the tremendous innovative work, research, and activities that librarians and other colleagues from around the world are conducting in the area of assessment. I’ve learned a lot, contributed where I could, and am leaving this conference feeling re-energized, renewed, inspired, and very encouraged in moving some of our own assessment initiatives forward.

I would like to thank everyone involved in the planning, organization, and delivery of this conference. It has been a truly enjoyable conference, and I am looking forward to continuing some of the conversations and relationships started here.

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Assessment is a great and varied thing. The types of projects and tools used in library assessment is as varied as our information needs. When I was asked to give the conference closing remarks and then to write my thoughts, I was honored; then I realized that I needed to take really good notes and attend a variety of sessions.

Follow the priorities
Both Debra Gilchrist and Margie Jantti (among others I am sure) talked about the importance of aligning library priorities to institutional priorities. This is done through several avenues. First, follow the money—where is it coming from and where is it going? Students are the life-blood of any institution. Jantti and Gilchrist encourage us to ensure that our services and resources support student learning and retention. Their presentations repeatedly address the fact that reaching out to those that underutilize the library is an important element in improving retention rates. Indirectly, we are encouraged to be flexible and creative in the types of services we offer to our students, in order to enable them to be successful in our institutions.

Another important way to determine institutional priorities is to consult mission and vision statements as well as the strategic plans of your organization. These documents are incredibly insightful and tell us exactly what institutions see as the top priorities. In developing library strategic planning documents, libraries are looking to these documents at the university level in order to inform library initiatives. In support of institutional mission statements, many librarians are responsible for some level of scholarly communication, data management, and research; libraries are exploring new roles for teaching and learning including virtual environments; and libraries are formalizing outreach and engagement through the creation of professional positions devoted to these activities both on campus and across their communities.

Finally, presentations from every conference track recommend that we talk to our users—whether they are students, researchers, community members, institutional administration, or I would also argue, our internal users. Relationship building, both internally and externally, will garner our libraries support from across campus that we would not otherwise get. While we cannot incorporate every suggestion that a person makes, listening to our users will create partnerships and support. Listening can be accomplished through a variety of mechanisms, such as ethnographies of space and information needs; user and self-assessments in instruction settings; conversations with first year, first generation, or international students; surveys; and a variety of other means. The important thing is that we listen and act on what our users need and want. Through these alignment activities, libraries will earn more recognition across campus as a partner rather than a building and collection.

Data
Data utilization and visualization are hot trends in both business and higher education. Reporting services provided to our users, as well as our impact on users, is a huge part of what we as librarians are trying to figure out how to do effectively. Sessions on survey design and implementation, focus groups, video and voice tools, data visualization tools, and data synthesis tools were discussed at various presentations. I came away with complementary messages—do not forget about the data we already have, but do not be afraid to gather new data. We all have data about circulation, gate counts, seating sweeps, collections reports—reports that we generate internally as well as reports from our vendors—how can we make all of this data tell the stories that we need to tell to our stakeholders? It is no longer as simple as saying, “look at how many things we checked out.” We must learn to tell the story of impact—impact on researchers, learners, knowledge creation, collaborative workflows, organizational effectiveness, and institutional assessment, among a laundry list of others. This requires libraries to become adept at collecting and
managing our data and agile in our reporting of data. This further requires new skills and tools such as knowledge of advanced research methodologies and statistics, as well as visualization tools and data management protocol. All of this sets us to become the institutional experts (or at least among the experts) for data management planning and a host of campus projects that involve big data. In short, we must learn to model what we teach.

**Weighing our options**
Many libraries are facing issues of space and space usage versus collections. How do we as libraries continue to provide access to a broad collection of research and scholarly publications while providing students and researchers the space and services they need to get things done? Many of us have answered this question by moving to more e-resources, which of course is creating its own set of problems around cost, levels of access, systems maintenance, and a host of other things I know very little about. Further, we must be more adept at leveraging collections data in order to inform collection decisions, improve collection funding, and to provide access to a variety of types of materials. I see this as an ongoing struggle for libraries, and the solutions will be as varied as the libraries that find them.

**Teaching ourselves**
Through various conversations I had with people at the conference, it appears that many of us had little experience with the concepts behind assessment when we took on assessment responsibilities, and our learning curves have been steep. We gained our knowledge of assessment willy-nilly, through reading the literature, talking to colleagues, attending a few webinars, many attending sessions at ALA, ACRL, or the Library Assessment Conference. While there are tools and toolboxes that have a variety of assessment methods and tools listed, none of these are exhaustive (they cannot be, really) and few are well known. A quick Google search on “library assessment toolkit” brings in library related assessment, but so much more that does not actually pertain to libraries—how does a new professional sift through it all? I would argue that we need a few really well developed and marketed places to start. They will need to be discipline specific on some level (i.e., instruction, collections, spaces, ethnography, library-wide assessment/strategic planning, rubric creation, statistics and regression analysis, etc.). Maybe we as a profession cannot be and do all of these things for new assessment professionals, but I think it is potentially important work that would be widely used and appreciated.

**Conclusion**
So, what were my takeaways from the 2014 Library Assessment Conference? Assessment is a tool that looks very different depending on the people and the situation. We as assessment professionals come to this field with an amazing array of experiences, skills, and needs, both personally and professionally. Our field is more rich, interesting, and beautiful (yes, I said beautiful) because of these variances. Our greatest means of learning about assessment tools is each other, and learning from one another must continue to be of the highest priority. Finally, if assessment is the tool that will drive library change, then we are the change agents for our libraries. I look forward to learning from and collaborating with many of you during the Library Assessment Conference in 2016.

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