



# RESEARCH LIBRARY TRENDS: *ARL STATISTICS*

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There is an increasing recognition of the limitations of the national data collection efforts for libraries, among them the *ARL Statistics*. On the other hand, a widespread recognition that amidst the flux and uncertainty of the information revolution the research library paradigm offers a sense of stability and opportunity to be realized in its digital future. Libraries are "competing" for attention with an increasing number of internet start-ups, as well as, established information service providers; they are in need of more management information and data to show their value in an increasingly competitive environment - a need that a variety of new and revived efforts in library statistics are trying to address.<sup>(1)</sup> Despite the shortcomings, *ARL Statistics*,<sup>(2)</sup> one of the oldest efforts,<sup>(3)</sup> does serve the purpose of describing research libraries in a sustainable way, sheds light on scholarly communication trends by showing the decline of ownership and the growth of access, and tracks gross trend activity in library services and expenditure allocations. *ARL Statistics* is illuminating both by what they tell and by the story they fail to tell.

*ARL Statistics* describes collections, staffing, expenditures, and service activities for the 121 member libraries of the Association of Research Libraries (ARL). Of these, 111 are university libraries; the remaining 10 are public, governmental, and private research libraries. ARL member libraries are the largest research libraries in North America, representing 15 Canadian and 106 U.S. research institutions. The academic libraries, which comprise about 92% of the membership, include 13 Canadian and 98 U.S. libraries.

The ARL Membership Criteria Index, an index developed to assess institutional investments in library resources for the purpose of establishing membership in the ARL, serves as a gross indicator that is prominently featured by the *Chronicle of Higher Education* each year. It has been called into question by both ARL directors and higher education administrators since it emphasizes the quantitative aspects of the institutional identity of a library rather than assessing qualitative contributions to a collective of research library resources. That collective of research library resources has defied a good definition because it is not only the succinct institutional identities, but also the dynamic networking and consortial activities that provide access to information as well as the actual information sources themselves; complicating matters in defining this collective of research library resources is the increasing amount of digital information and the emergence of new institutional identities that are hard to characterize using established paradigms. Amidst this flux, the institutional identity of a research library has served as a succinct and stable point of reference and *ARL Statistics* has provided an enduring description of the resources and services research libraries provide helping us understand their evolution.

## THE DECLINE OF OWNERSHIP

The story of declining ownership is a story of library budgets struggling to keep up with serial and monograph cost increases (see [Table 1](#)). As serial prices grow, libraries must spend rapidly increasing amounts of money and still cannot sustain their serial subscriptions (see [Figure 1](#)). Monographic acquisitions also indicate a similar pattern, though with much lower cost increases compared to serials, but much larger declines in acquisition rates. At the same time, services such as interlibrary loan are used more heavily, as shown in Figure 2. Consequently, resources per student are reduced, while levels of service activities are increasing.

In more specific terms, ARL data show that, while ARL libraries spent 2.7 times more money for serials compared to 1986, they bought 6% fewer serial titles ([Figure 1](#)). During the last decade, libraries shifted expenditures from monographs to serials to meet some of the demands of increasing serial prices, reducing the number of monographs purchased by 26%, which makes a record low median figure of 24,294 monographs purchased in 1998-1999, while the unit cost for monographs increased by 65%.<sup>(4)</sup> Since 1986, the average annual increase for the serial unit cost has been 9.0% and for the monograph unit cost 3.9%, both higher than the general inflation trends, which was 3.3% on average, in North America during the same period.

**Table 1**

**Monograph and Serial Costs in ARL Libraries, 1986-1999, 2020**  
Median Values and Average Annual Percent Changes

Year	Serial Unit Cost	Serial Expenditures	Monograph Unit Cost	Monograph Expenditures	Serials Purchased	Monographs Purchased
(Libraries included)	40	103	62	99	40	62
<b>1986</b>	\$87.09	\$1,517,724	\$28.67	\$1,120,645	16,312	32,679
<b>1987</b>	\$104.79	\$1,770,567	\$31.79	\$1,064,484	16,600	26,240
<b>1988</b>	\$116.65	\$1,979,604	\$35.83	\$1,141,226	16,456	25,570
<b>1989</b>	\$128.22	\$2,130,162	\$38.39	\$1,241,133	16,298	27,082
<b>1990</b>	\$130.07	\$2,304,744	\$40.34	\$1,330,747	16,221	27,545
<b>1991</b>	\$150.02	\$2,578,309	\$42.16	\$1,400,738	16,250	27,524
<b>1992</b>	\$161.74	\$2,630,827	\$43.62	\$1,353,865	15,896	26,344
<b>1993</b>	\$184.49	\$2,919,756	\$42.76	\$1,295,807	15,668	25,188
<b>1994</b>	\$190.26	\$2,932,091	\$44.51	\$1,309,807	15,698	25,341
<b>1995</b>	\$211.48	\$3,133,885	\$45.13	\$1,365,575	14,741	25,707
<b>1996</b>	\$219.19	\$3,393,307	\$46.76	\$1,444,015	15,223	25,911

<b>1997</b>	\$234.55	\$3,674,368	\$46.58	\$1,460,234	15,450	28,576
<b>1998</b>	\$244.18	\$3,818,832	\$47.94	\$1,486,764	15,615	24,447
<b>1999</b>	\$267.09	\$4,098,075	\$47.40	\$1,506,651	15,259	24,294
Avg. annual % change:	9.0%	7.9%	3.9%	2.3%	-0.5%	-2.3%
<b>Scenarios for 2020, assuming annual rate of change for unit costs remains constant</b> (figures <i>in bold italics</i> are held constant from 1999 results)						
Scenario	<b>9.0%</b>	<b>7.9%</b>	<b>3.9%</b>	<b>2.3%</b>	<b>-0.5%</b>	<b>-2.3%</b>
One †	\$1,632	\$20,390,881	\$107	\$2,430,310	13,700	15,048
Scenario	<b>9.0%</b>	9.0%	<b>3.9%</b>	3.9%	0.0%	0.0%
Two ‡	\$1,632	\$25,034,352	\$107	\$3,364,644	<b>15,259</b>	<b>24,294</b>
Scenario	<b>9.0%</b>	10.0%	<b>3.9%</b>	5.0%	1.0%	1.0%
Three §	\$1,632	\$33,359,779	\$107	\$4,197,473	18,805	29,940

† Scenario 1: Rates of change for all variables remain the same. (Depicted in chart.)

‡ Scenario 2: Numbers of serials and monographs purchased remain the same.

§ Scenario 3: Modest increase in numbers of serials and monographs purchased.

Assuming the same average annual rate increases and projecting them into the future, the median ARL library will be paying \$1,632 for a journal subscription and \$107 for a monograph in 2020 (see [Table 1](#), Scenario 1, and [Figure 1](#)). Such a library will lose purchasing power, buying only 13,700 serials and 15,048 monographs--16% fewer serials compared to 1986 and 54% fewer monographs.

But is it reasonable to assume no change in the average annual rates over the next 20 years? Scenario 2 ([Table 1](#)) is based on a projection for 2020 where the median library maintains its current purchasing level and Scenario 3 on a projection that shows how much the median library would have to spend in 2020 to purchase a modest 1% more serials and monographs per year over the next 20 years.

On the other hand, one might argue that instead of stable or increasing annual rates, we might be entering into an era where the increasing availability of electronic information will be reducing the costs associated with serials, monographs and other new formats (e-books, aggregator databases, e-journals, etc.). Although the idea of providing enduring access to information resources at low, marginal, or even no direct costs is appealing and promising with major implications for research libraries, it has yet to prove itself.

But what are some of the forces that have sustained a relatively stable number of serial subscriptions despite a sustained pattern of large price increases? In a recently published article on the impact of publisher mergers on journal prices, Mark McCabe presents a new portfolio theory of publisher mergers to show the remarkable inelasticity (i.e., insensitivity to price) of library demand for serials, which gives publishers "a strong incentive to increase prices faster

than the growth rate of library budgets."<sup>(5)</sup> With serial cancellations, some budget increases, and significant reductions in monographs purchased, library budgets have been able to absorb most of the serial price increases, as serial subscriptions decline only marginally compared to the price increases.

How are libraries finding ways to cope with the exorbitant increases in the prices of scientific journals, the primary cause of the overall serial price increase reflected in the *ARL Statistics*? The story that is not told through the numbers is how complex the academic library environment is and how these trends are tied to the transformational nature of new technologies and networking capabilities. Although most monographs and serials are still produced in a paper format, traditional formats are being challenged by the electronic production and dissemination of scholarly publications. Electronic communication and the establishment of networks, consortia, and inter-institutional agreements are similarly making the distribution of information more effective, not only for digitized materials, but for printed books and/or photocopies, as well.

Is increased awareness of the challenges facing libraries by faculty and administrators going to help? Initiatives such as the Scholarly Publishing and Academic Resources Coalition (SPARC), ARL and Association of College and Research Libraries (ACRL) CREATE CHANGE Web resource are designed to help guide researchers and librarians toward solutions to the scholarly communication crisis.<sup>(6)</sup> Declaration of principles by university administrators <sup>(7)</sup> and librarians <sup>(8)</sup> also aim at sparking the debate and engaging the academic community to come up with creative solutions to the challenges and opportunities that the information revolution holds for higher education institutions and their libraries.

New publishing models are being introduced aiming at increasing competition such as SPARC initiatives and Open Archives; distributing scholarly communication more effectively such as Highwire, Project Muse, JSTOR, PubMed Central and BioOne; reaching and creating new markets and new products such as netLibrary, Questia and ebrary. Although, it is very early to determine which models will be most successful in providing enduring access to scholarly information, technological innovations will only endure when they become an integral part of the scholarly communication cycle.

Libraries are but one link in this cycle. The decline in library acquisitions is affected by a number of external factors beyond the publishing industry including a strong emphasis on scientific and technical research, expectations for timely information, the twigging effect of specialization in new fields of knowledge, reward mechanisms in the academy and the challenge new forms of communication are presenting. No matter what the underlying causal relations, research libraries are exchanging some of the traditional archival imperatives for the user demands of "information here and now." Library leaders are feeling the tough competition that the growth in the information sector has brought and visions of triumph or demise for libraries abound in the literature.<sup>(9)</sup>

## **THE PROMISE OF ACCESS**

Although libraries are buying fewer serials and monographs than they did 13 years ago, they serve a slightly higher number of students and faculty (See [Figure 2 and Table 2](#), "Supply and Demand in ARL Libraries"). In 1986, the typical ARL library subscribed to 16,312 serials and bought 32,679 monographs for 16,684 students and 1,125 faculty. In 1999, however, it bought only 15,259 serials and 24,294 monographs for 18,502 students and 1,301 faculty.

As serial subscriptions are canceled and monograph purchases are reduced, faculty and students are borrowing through interlibrary loan 2.7 times as many items in 1999 as they did in 1986. The 1995-96 ARL ILL/DD Performance Measures Study has found that the cost of a borrowing transaction ranges from a low of \$9.76 to a high of \$27.84, with an average cost of \$18.35 in 1995-96 U.S. dollars for a research library.<sup>(10)</sup> If we adjust this figure for inflation using the U.S. Consumer Price Index, it comes to an average cost of \$19.48 in 1998-99. By contrast, the cost of purchasing a serial or a monograph is considerably higher. To the unit cost of \$267 for a serial subscription or \$47 for a monograph, a library would add processing costs of perhaps \$55 or more. Then, based on cost alone in relation to annual use, a library could consider purchasing a serial only if it is expected to be used about 16-17 times in a year and a monograph only if it is expected to be used at least five times.<sup>(11)</sup>

Even if processing costs are excluded, a serial subscription still needs to be used more than 13 times in a year and a monograph at least twice to consider making a purchasing decision. If the actual usage for a particular serial subscription or monograph is less than these numbers, it may be more economical to acquire the needed information through interlibrary loan and document delivery services.

Of course, this economic scenario works only as long as there are libraries, or other institutions, that continue to collect materials regardless of annual usage and that are willing to provide those materials to other libraries. ARL data show research libraries are lending 65% more items today than they did 13 years ago. In 1995-96, the cost of a lending transaction for research libraries ranged from a low of \$4.87 to a high of \$16.34, with an average cost of \$9.48 or, with an adjustment for inflation, a 1998-99 average cost of \$10.07.<sup>(12)</sup> The roles of acquirer and provider have usually been performed by research libraries whose mission statements encourage those roles and whose acquisitions budgets make it possible for them to support themselves and others while allowing access to materials for both current and future users.

Given the cost considerations for interlibrary loan and document delivery (ILL/DD) and the number of interlibrary loan transactions, university research libraries spent in the aggregate only 1.6% of their total library expenditures for lending and 2.2% for borrowing in 1998-1999. This total of 3.8% generally includes ILL/DD personnel expenses, unlike the 37% spent on library materials, which excludes processing and personnel expenditures.

To more effectively satisfy the information needs for resources that are unavailable locally, many libraries have joined state-wide and regional consortia through which they share not only resources through interlibrary loan but also some of the financial burdens of licensing information sources.<sup>(13)</sup> Libraries are placing more emphasis on access, as the cost of access appears to be more affordable than the cost of ownership. State legislators have also demonstrated a willingness to invest in state-wide library systems (e.g., California Digital Library, Georgia's Galileo, Illinet Online, OhioLINK, TexShare, Virginia's VIVA, etc. <sup>(14)</sup>) in order to more efficiently use library resources.

Research institutions are pioneers in extending such cooperation beyond political and geographic boundaries: for example, the Committee for Institutional Cooperation (CIC),<sup>(15)</sup> a harbinger of a distributed global scholarly library network, crosses state boundaries in the United States. The establishment in 1997 of the International Coalition of Library Consortia (ICOLC), whose goal is to serve higher education institutions by keeping members informed about new electronic

information resources and the pricing practices of electronic providers and vendors, also demonstrates a strong interest among library consortia to work together on issues that are fundamental to realizing this global scholarly network.<sup>(16)</sup>

As the research library environment moves to even speedier networks with the development of Internet2 (I2)<sup>(17)</sup> and the Next Generation Internet (NGI) Initiative,<sup>(18)</sup> issues related to mechanisms for establishing access and costs for managing content on such networks are fundamental concerns for the library of the future.

The financial picture for research libraries is evident in [Figure 3 and Table 3](#), "Expenditure Trends in ARL Libraries." Library material budgets have been rising quickly in order to sustain serial expenditures. Operating expenditures, where many automation and digital infrastructure expenditures are reported, are also increasing rapidly.<sup>(19)</sup> A slower increase is noted for total salary expenditures, which reflects a combination of slightly increasing salaries and staff reductions. Monograph expenditures, although rising somewhat steadily in recent years, have been increasing at a much slower pace to accommodate the ever-increasing serial expenditures and new electronic resources. The annual Consumer Price Index (CPI), included on [Figure 3](#), provides a reference for the increases in library expenditures.

## **SERVICE TRENDS**

The success of an academic library is dependent not only on the information resources it owns or licenses but also on the services it provides. ARL collects data about public service activities such as circulations (initial and total), reference transactions, library instruction (group presentations and participants in these presentations), and interlibrary borrowing and lending (see [Table 4 and Figure 4](#), "Service Trends in ARL Libraries"). These data, rather than being comprehensive for the range of user-initiated library activities, represent select service areas. Readers should be cautious when they use these data for comparisons across institutions because local policies can influence the level of service activities. For example, loan periods, which are usually determined by local policies, vary widely among libraries; thus, a library with a shorter loan period will report a larger number of circulation transactions than will a library with a longer loan period, other things being equal.

With this in mind, it is useful to look at the trends of these select services assuming that those changes in policies and other conditions affecting measurement of services are random rather than systematic in one direction or another. [Table 4](#) indicates that there was a significant increase in the total number of services delivered to users from 1991 to 1996 with no parallel staff increases. Starting in 1998 reference and circulation service transactions dropped back to the 1991 levels of activity; in 1999 library instruction dropped both in terms of group presentations and participants in group presentations this year; whereas interlibrary borrowing continues to grow more or less at the same rate.

Regarding the decline of the number of reference transactions, a variety of explanations have been voiced in the field. The 1991-1996 increases heightened the pressure of providing reference service, which may have negatively impacted services especially in those libraries where there was no parallel increase in the staffing levels. Many libraries are making a concerted effort to examine the changing user needs that impact reference services in general. Heavy users of library materials and services may make fewer trips to the library than was the case before the availability of online catalogs, remote access to indexing and abstracting databases, and

electronic full-text resources. Often, though, those people who do show up at the library or reference desk require more assistance than before. At the same time, electronic and email reference are adding another dimension to the growing complexity of responding to reference questions. Libraries have instituted initiatives with a deliberate emphasis on direct contact between subject specialists and departments (shifting research consultation activity away from desk-based service). Thus, a simple count where each reference question gets a single "tally" cannot capture the varying dimensions and growing complexities of reference services. While patterns of behavior are changing and there is a slight decline in reference transactions, the overall numbers are still substantial, about 130,000 questions per year for the median ARL library.

Demand for library user education and interlibrary borrowing has been high over the last few years. In only six years, instructional sessions (group presentations) have risen by 39%, participants in these sessions by 32%, and interlibrary borrowing by 84%. Library instruction declined slightly this year compared to last year, possibly as a function of the introduction of distance learning technologies in the delivery of library instruction.

Perhaps of most interest is the fact that, by 1999, more than one out of every four instructional sessions conducted in a typical ARL library had been added since 1991. The typical ARL library offered over 714 "teaching" sessions in 1998-99. If we assume that each session was at least an hour long, then, on average, the typical library offered the equivalent of 16 three-hour credit courses last year. Each course was attended on average by 13 people with a median number of 9,400 people receiving formal education through library instruction in a typical ARL library.

## **THE BOUNDLESS SKY**

In sum, purchases of fewer serials and monographs since 1986 coupled with increases in expenditures for these items are indicators of the continuing declining purchasing power of research libraries. Higher levels of service activities in interlibrary loan and library instruction services serve as indicators of increased access to, rather than ownership of, library resources. The fluctuating, and possibly declining, trends of reference and circulation services since 1996 serve as indicators of the changing and increasing complexity of information needs of library users as well as the ease of online access to digital resources.

The World Wide Web has revolutionized the way that libraries are delivering services, enabling them to offer more value, ranging from remote access to online catalogs, indexing and abstracting tools and full-text resources. The delivery of new and innovative services through digitization projects and distance learning technologies are transforming the brick-and-mortar library model to the virtual library model. We are in the early stages of a transition period where the hybrid library model will reign. Research library roles are being redefined as the research and academic community undergoes changes.

*ARL Statistics*, which have been primarily input based metrics, is shifting in importance and placement in history. *ARL Statistics* does not assess, for example, the quality of an organization in meeting user needs, yet there is an increasing recognition that we need measures telling us how our users view us. *ARL Statistics* does not tell us how the provision of electronic resources are making users more or less successful in their pursuit for information.

ARL is engaged in a variety of projects through the New Measures Initiative that aim at developing tools to assess the library's impact on teaching, learning, and research, as well as, the

ability of libraries to control costs and add value to the services they provide. A pilot-project in the e-metrics area aims at developing measures for describing more coherently library's networked resources. The goal of these pilot projects is to develop measures that show the value of libraries to the community of users - new measures for renewed libraries.<sup>(20)</sup>

Where will research libraries be 10, 20, or 50 years into the future? Current technological innovations are readily adopted and barriers to access are gradually being reduced. It is very likely that as the access model continues to offer more information at lesser cost to an increasing number of people, the ownership model may be reserved for the high-cost, low-usage information resources that are of value to a smaller group of people. Which libraries will be able to afford to pay for both access and ownership and what would the tradeoffs be? The only answer to this question can be at best speculative and at worst dead wrong.<sup>(21)</sup>

Yet, users expectations of what their libraries can offer are increasing rapidly here and now. The relatively stagnant library budgets are struggling to keep up with those rising expectations in addition to the rising serial costs and the rising electronic resources. Are we doing a disservice to our users by accepting stagnant library budgets at a time of unprecedented innovation and development in the information world? After all libraries are at the heart of research and development in every research university involved in one way or another in some digitization project developing digital library services<sup>(22)</sup> as is evident by registry services such as the Digital Initiatives Database (DID).<sup>(23)</sup>

How can research libraries be funded to not only meet rising serial and monograph costs, access and development of electronic resources but also surpass the rising user expectations? Jerry Campbell has outlined a vision for a Scholar's Portal that might offer an answer to the above question.<sup>(24)</sup> Although the library has been viewed as a bottomless pit in the past at times of financial constraint and recession, we might just have been viewing things from the wrong side. Because instead of a bottomless pit, it may be more like the boundless sky at times of unprecedented innovation and development.

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## ENDNOTES

1 Mary Jo Lynch describes a variety of new and old efforts in library data collection in a recent article entitled "Academic Library Statistics: New Players Change the Scene" <<http://www.ala.org/alaorg/ors/ncesals.html>> (accessed Sept 1, 2000).

2 *ARL Statistics 1998-99* is the latest in this series of annual publications.

3 Kendon Stubbs, "Apples and Oranges and ARL Statistics." *Journal of Academic Librarianship* 14 (September 1988): 231-235.

4 In 1997, ARL cosponsored a conference highlighting the problems facing the specialized scholarly monograph. See <<http://www.arl.org/scomm/epub/program.html>> (accessed Sept 1, 2000).

5 Mark J. McCabe, "The Impact of Publisher Mergers on Journal Prices: An Update," *ARL: A Bimonthly Report on Research Library Issues and Actions from ARL, CNI, and SPARC*, no. 207 (Dec. 1999): 4, also available at <<http://www.arl.org/newsltr/207/jrnprices.html>>.

6 Create Change <<http://www.arl.org/create/>> (accessed Sept 1, 2000).

7 "Principles for Emerging Systems of Scholarly Publishing," *ARL: A Bimonthly Report on Research Library Issues and Actions* from ARL, CNI, and SPARC, no. 210 (June 2000): 1, also available at <http://www.arl.org/newsltr/210/>.

8 The Keystone Principles <http://www.arl.org/newsltr/207/keystone.html> (accessed Sept 1, 2000).

9 Doug Brown, "Library: Checking Out in the Digital Era" *ZD Net Inter@ctive Week* (June 26, 2000) [NO LONGER AVAILABLE: 8/2002] (accessed Sept 1, 2000).

10 Mary E. Jackson, "Measuring the Performance of Interlibrary Loan and Document Delivery Services," *ARL: A Bimonthly Newsletter of Research Library Issues and Actions* (December 1997): 2, also available at <http://www.arl.org/newsltr/195/ildds.html>.

11 According to Dilys E. Morris, Collin B. Hobert, Lori Osmus, Gregory Wook, "Cataloging Staff Costs Revisited," *Library Resources and Technical Services*: 44: 70-83 (2000): In 1997-98 the average cost of cataloging a title at Iowa state was \$16.25. This cost covers all material formats and all levels of cataloging and recataloging, including PromptCat titles. Just seven years earlier, the cost was \$20.83 (or \$24.95 in constant dollars), representing a 22% drop, or 34% drop when adjusted for inflation. Serials cataloging at \$59.33 per title (including recataloging) is five times more expensive than monographs cataloging (\$12.11 per title).

12 Jackson, p. 2.

13 Martha Kyrrillidou, "New Collections, New Marketplace Relations," *Resource Sharing and Information Networks* 14, no. 1 (1999): 73-74.

14 California Digital Library: <http://www.cdlib.org/>.

Georgia's Galileo: <http://www.galileo.peachnet.edu/>

Illinet Online: <http://pac.ilcso.uiuc.edu/>

OhioLINK: <http://www.ohiolink.edu/>

TexShare: <http://www.texshare.edu/>

VIVA: <http://www.viva.lib.va.us/>

15 <http://www.cic.uiuc.edu/>.

16 <http://www.library.yale.edu/consortia/>.

17 <http://www.internet2.edu/>.

18 <http://www.ngi.gov/>.

19 The ARL Supplementary Statistics that tracks expenditures for electronic resources shows that in 1992-93 libraries spent on average 3.6% of their materials budget for electronic resources; the latest 1998-99 report shows that libraries spent 10.5%. This is an average expenditure for electronic resources including compute files, monographic acquisitions and serials expenditures of \$742,598 for the 105 ARL university libraries reporting data, or a total of \$77,972,773. See <http://www.arl.org/stats/arlstat/#sup> (accessed Sept 1, 2000).

20 ARL New Measures Initiative Homepage <http://www.arl.org/stats/newmeas/newmeas.html>.

21 Steve Coffman, "Building Earth's Largest Library: Driving into the Future," *Searcher* 7 (March 1999), also available at <http://www.infoday.com/searcher/mar99/coffman.htm>.

22 William Arms, *Digital Libraries* (Cambridge, MA: MIT, 1999): 56.

23 ARL Digital Initiatives Database <http://www.arl.org/did/> (accessed Sept 1, 2000).

24 Jerry D. Campbell, "The Case for Creating a Scholar's Portal on the Web: a White Paper" *ARL: A Bimonthly Report on Research Library Issues and Actions* from ARL, CNI, and SPARC, no. 211 (Aug. 2000): 1-3, also available at <<http://www.arl.org/newsltr/211/portal.html>>.

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