The Use of Statistics by Libraries in North America

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Introduction

Why are data on library operations important and necessary to collect? There are primarily two major goals in collecting data about library operations: (a) to describe the organization and (b) to evaluate whether the organization is fulfilling its mission. The ultimate use of library data is to help library managers in their decision making activities so that the organization works more effectively and efficiently.

Data may be collected at a variety of different levels (input, output, outcome, impact measures) to serve different evaluation perspectives (library, actual and potential users, organization, industry/sector, and society). Academic libraries in North America have been rather successful in collecting input and to some extent output data. However, increased attention is being given lately to impact measures (including usage, outcomes, and impact in relation to environmental characteristics).

In North America, library data collection takes place at the unit-departmental level, the library-wide level, the cross-institutional level and the national level. I will focus on how libraries use statistics at the cross-institutional level. There are a variety of organizations that collect data on libraries in general and academic libraries in particular. The most well known cross-institutional data gathering activities related to libraries in North America include the efforts of the following organizations:

1. The National Center for Educational Statistics (NCES), a division of the United States Department of Education, collects data on:

- public libraries on an annual basis

- academic libraries on a biennial basis

- school libraries every five years

- state library agencies on an annual basis

- federal libraries and information centers every five years

- library cooperatives every five years (new project!)

Because NCES collects data on academic libraries every two years, other academic library agencies saw the need to collect data more regularly and

more rapidly on an annual basis. So, the following organizations are also involved in data gathering activities for academic libraries:

1.   Association of Research Libraries (ARL)

2.   Association of College and Research Libraries (ACRL), a division of the American Library Association (ALA)

3.   Canadian Association of Research Libraries (CARL)

4.   Association of Southeastern Research Libraries (ASERL)

5.   Higher Education or Library Agencies in various states

ARL Statistics and Measurement Program

I will discuss examples of uses of data primarily collected by the Association of Research Libraries (ARL)[1] with an emphasis on the kind of information that potentially could be useful in the Greek Academic library environment. ARL has collected library statistics since 1962 and it has a formal Statistics and Measurement Program that supports these activities. In particular, the ARL Statistics and Measurement Program serves the objective to "describe and measure the performance of research libraries and their contribution to research, teaching, scholarship, and community service".

This program, similarly to other ARL programs, operates with the support of an advisory committee, the ARL Statistics and Measurement Committee, which is comprised of about eight directors who advise the program staff on the various projects undertaken by the program. The ARL Statistics and Measurement Committee meets twice a year to discuss issues related to recurring and new projects.

Strategies to accomplish the general objective of "describing and measuring the performance of research libraries" include:

•   collecting, analyzing, and publishing quantifiable information about library collections, personnel, and expenditures, as well as expenditures and indicators of the nature of a research institution;

•   developing new measures to describe and measure both traditional and networked information resources and services;

•   developing mechanisms to assess the relationship between campus information resources and high quality research, the teaching environment and, in general, the success of scholars and researchers;

•   providing customized, confidential analysis for peer comparisons;

1.   ARL is a not-for-profit organization representing 121 research libraries in the US and Canada. For more information, see http://www.arl.org

- preparing workshops regarding statistics and measurement issues in research libraries;

- sustaining a leadership role in the testing and application of academic research library statistics for North American institutions of higher education; and

- collaborating with other national and international library statistics programs and accreditation agencies.

The first strategy of "collecting, analyzing, and publishing quantifiable information about library collections, personnel, and expenditures, as well as expenditures and indicators of the nature of a research institution" is accomplished through the following publications:

- ARL Statistics, continuing the oldest series of library data that goes back to 1908, by collecting data on library services, collections, expenditures and staffing
- ARL Academic Law and Medical Library Statistics, same survey as the one used in ARL Statistics but only for law and medical libraries
- Annual Salary Survey
- ARL Preservation Statistics
- Developing Indicators for Academic Library Performance: Ratios from the ARL Statistics

Although I cannot discuss in detail all the uses these data are subject to, I will highlight a couple of different functions data collected through the *ARL Statistics* survey serve:

(a) The **ARL Membership Index** is a five variable-index which was determined by factor analysis of 22 variables and represents the elements in which ARL university libraries most resemble one another. The index does not attempt to measure a library's services, quality of collections, or success in meeting the needs of users. It is simply a composite measure of the exten-siveness of library investments by a particular institution. The index is a summary measure of relative size among the membership of the association, and is used as a quantitative membership criterion for university libraries. To gain or sustain membership in ARL, a library needs to preserve a certain level of investment on these resources comparable to the investments of other member libraries.

The index is calculated using five data elements:

- number of volumes held
- number of volumes added (gross)
- number of current serials received
- total operating expenditures

- number of professional plus support staff

(b) Through data collected via the ARL Statistics, we are able to chart various **general trends** that affect today's research communities, information that is used to educate the larger academic community (faculty, students, and administrators) about the challenges modern libraries are facing. For example, by collecting data on the number of purchased subscriptions and expenditures for these subscriptions we can chart the increases in the cost of serials for ARL libraries over the last decade. Similarly, we do the same for monographs. The chart on the *costs of serials and monographs* (see Appendix) has been one of the most effective ways the library community has used to highlight the crisis in scholarly publishing which is tied to strong emphasis on scientific and technical information, expectations for timely information, the twigging effect of specialization in new fields of knowledge and the reward structures for faculty in institutions of higher education. No matter what the underlying causal relations for the trends in the costs of library materials, it is recognized that research libraries are exchanging some of the traditional archival imperatives for the demands of "information here and now". An assertion that is also supported by two other popular charts created through *ARL Statistics,* one showing how demand for library materials through inter-library loan is increasing while resources are being reduced (entitled *"Supply and Demand")* and, a second chart showing the large increases in the amount of service provided in ARL libraries while staffing is reduced (see chart entitled *"Service Trends").*

c) More recent efforts concentrated in developing sets of **performance indicators,** i.e. measures derived from existing ones such as ratios of volumes per faculty or student, that aim at sensitizing libraries in the use of objective data and information for library decision making. Although the various proposed ratios are not indicators of quality, they are relative measures that can be evaluated in the context of local goals and circumstances.
From all the multitude of possible ratios that can be created through data collected in the ARL Statistics, ARL has highlighted 30 ratios that are published as part of an annual publication called *Developing Indicators for Academic Library Performance: Ratios from the ARL Statistics.* These thirty ratios really represent three distinct categories of ratios, one set dealing with resources per faculty, a second dealing with resources per student (see chart entitled **"Resources Per Student"),** and a third set of ratios that have to do with internal operations (such as costs of serials and monographs, percent of expenditures spent on salaries or library materials, ratio of items borrowed to items loaned, etc.).

In addition to highlighting these thirty ratios in this separate publication, ARL with the support of the Social Science Data Center of the University of Virginia Library has published all the ARL data through a World Wide Web (WWW) interface that lets any user create interactively any conceivable ratio they may deem worth examining for their local conditions and for their local

decision making activities. Through this powerful WWW interface, we hope libraries will start making more use of both the raw data, as well as, start developing indicators for their successes or failures in reaching local goals and objectives (see Appendix, http://www.lib.virginia.edu/socsci/newarl/).

One should not fail to mention the following work that has been done in the area of performance indicators through other agencies:

• ISO CD 11620 standard on Library Performance Indicators

• *1FLA Guidelines for Performance Measurement in Academic Libraries* (London: K.G. Saur, 1996)

• Joint Funding Councils' Ad-hoc Working Group on Performance Indicators for Libraries. *The Effective Academic Library: a framework for evaluating the performance of UK academic libraries.* London, HEFCE, 1995

The second strategy of the ARL Statistics and Measurement Program, "to develop new measures to describe and measure both traditional and networked information resources and services", is being served by projects like the following ones:

(a) There is a systematic effort under way to prepare libraries in not only being able to satisfy their users through their services but to also exceed their users expectations. A way to evaluate how well libraries meet and exceed their users expectations is by asking the users themselves. So, there have been a series of workshops emphasizing the importance of **user surveys** in library decision making. User surveys are not seen as one time marketing ploys but rather as a systematic effort to collect information about how well we serve our users, as a long-term assessment method that is to be used more than once in measuring improvements in the way we serve our users, and as an important tool in realigning organizational priorities and focus based on what the users want. In addition to the workshops on user surveys that have been offered so far, a new publication is under preparation entitled *After the User Survey, What Then?* highlighting libraries that are changing their culture and their policies in response to what their users told them they want. As the author points out that "Libraries that have taken their user surveys to heart also speak of "reallocating resources". They are not waiting for more funding to address user needs, they are trying to see what can be done with what there is. Departmental restructuring, refocusing acquisitions, and other, different ways of doing the library's business are being examined and implemented"[2].

(b) Last, an increasingly important area of research has been the measurement and evaluation of library investments in *electronic and networked resources.* ARL has had relatively modest success in collecting pilot data on expendi-

2. GraceAnne A. DeCandido, *After the User Survey, What Then?* (Washington, D.C.: Association of Research Libraries, forthcoming): 446

tares for electronic resources through an experimental survey entitled "Supplementary Statistics". More recently and with some modest funding from the Council of Library Resources, we were able to employ the help of Tim Jewell, Electronic Services Coordinator at the Libraries in the University of Washington. He was able to analyze the data ARL has collected in this area since 1992 and propose further modifications to the survey to make it more useful in the future. Some of the lessons we have learned from this project include our inability to define what a database is and the confirmation of the fast increases in expenditures for all types of electronic resources. Although we are still not happy with the typology of electronic resources used in the survey, the fact that there is some hard evidence about the extent of investments in electronic resources is a goal that seems to be making this effort worthwhile continuing. Below is a summary table on data regarding expenditures for electronic resources based on the ARL Supplementary Statistics survey since 1992:

	92-93	93-94	94-95	95-96 1
Computer File Expenditures				
Total	$14,147,625	$20,132,553	$22,030,727	$24,609,821
Average	$172,532	$236,854	$249,286	$253,709
Median	$148,158	$212,936	$226,318	$210,890
Electronic Serial Expenditures				
Total			$11,847,577	$15,170,972
Average			$188,057	$174,379
Median			$156,754	$148,166 |
Electronic Resources (total of above)				
Total	$14,147,625	$20,132,553	$33,878,304	$39,780,793 \
Average	$172,532	$236,854	$349,261	$364,961 I
Median	$148,158	$212,936	$278,404	$301,992 1

	92-93	93-94	94-95	95-96
Lib. Materials Expend, for Respondents				
Total	$393,271,073	$425,287,651	$489,664,539	$571,145,98 6
Average	$4,795,989	$5,003,384	$5,380,929	$5,654,911
Median	$4,242,887	$4,527,122	$4,714,384	$4,975,353
		•		
E-Resource $ as Percent of Library Materials Expenditures	3.60%	4.73%	6.92%	6.97%
N= (of 108 Academic ARLs thru 94-95,109 in 95-96)	82	85	97	101

ARL efforts have concentrated primarily on defining expenditures and expenditure categories. However, there are other efforts in this area that are looking into the networked environment in a more holistic way:

Charles McClure and Cynthia Lopata's publication on *Assessing the Academic Networked Environment: Strategies and Options* (Washington D.C.: Coalition of Networked Information, February 1996) is one such effort. Currently the approach proposed in this publication is under testing in a few institutions trying to collect empirical evidence for the methods proposed and ultimately improving them even more (http://www.cni.org).

In the UK, Peter Brothy and Peter M. Wynne have tried to supplement the Effective Academic Library indicators by developing the EAL+ set. This is an enhanced set of indicators where they try to take into account the Measurement of the Electronic Library by adding nine additional indicators in the pre-existing set of indicators proposed by the Effective Academic Library Report (http://www.ukoln.ac.uk/models/studies/).

Conclusion

Some of these efforts could be modified and adopted by the Greek Academic Libraries with relatively little effort. In particular, one could try to group Greek academic libraries (and for that matter even European libraries) based on the extent of resources they own, the comprehensiveness of their collections, the cost of their resources, whether they are adequate for the student and faculty populations, how well they meet the needs of their users and how satisfied the users are, and how we can start evaluating the academic networked environment.

I believe that the major challenge for the Greek library environment is less so the actual data collection effort but rather a change in the attitude of management of libraries (and other public sector organizations for that matter) from a model that rewards conformism, assimilation, centralized decision making, glorification of the powerful individual to one that would reward innovation, initiative, team work, and empowerment of individuals to improve their work environment to operate more effectively and efficiently.

Decision making activities need to move to the front line librarians to the largest degree possible; the people who provide a service are usually in a much better position of making decisions related to that service area; once front line librarians start facing the responsibility of making decisions, they will discover the value of data in guiding their decision making activities and thus data collection becomes not only something useful in their daily activities but something that is absolutely necessary in their providing good service. This new decision making model is in some ways a necessary prerequisite for the effective collection of data at the cross-institutional level.

In Greece, there is a current effort of library data collection underway at the cross-institutional level, covering both public and academic libraries, under the direction of Dr. G. D. Bokos at the Department of Archival and Library Studies at the Ionian University funded by the National Center for the Book. This effort can be seen as a first descriptive approach to the issues and I hope that it will initiate other activities related to library data gathering with a gradual emphasis on performance measurement to encourage more effective and efficient management of libraries.

Academic libraries in particular face special challenges that need to be addressed with specially designed systematic data gathering activities accompanied by a wide distribution of the findings. As Charles Angoff and H. L. Menken reminded us "Statistics, to be sure, are not always reliable, but we have nothing better, and we must make as much of them as we can".

Bibliography

Association of Research Libraries. *ARL Statistics 1995-96.* (Washington, DC: Association of Research   Libraries, 1997).

Association of Research Libraries. *ARL Preservation Statistics 1995-96.* (Washington, DC: Association of Research Libraries, 1997).

Association of Research Libraries. ARL *Annual Safely Survey 1996-97.* (Washington, DC: Association of Research Libraries, 1996).

Association of Research Libraries. *Reports of the AAU Task Forces on: Acquisition and Distribution of Foreign Language and Area Studies Materials; A National Strategy for Managing Scientific and Technical Information; Intellectual Property Rights in an Electronic Environment.* (Washington, DC: Association of Research Libraries, 1994).
 http://www.arl.org

Atkins, Stephen E. *The Academic Library in the American University.* (Chicago: American Library Association, 1991).

Brophy, Peter and Peter M. Wynne. *Management Information Systems and Performance Measurement for the Electronic Library: eLib Supporting Study.* (University of Central Lancashire, Centre for Research in Library and Information Management, June 1997) http://www.ukoln.ac.uk/models/studies/

Cummings, Anthony M., Marcia L. Witte, William G. Bowen, Laura O. Lazarus, and Richard H. Eckman. *University Libraries and Scholarly Communication: a Study Prepared for The Andrew W. Mellon Foundation.* (Washington DC: Association of Research Libraries, 1992).

Dolence, Michael G. and Donald M. Norris. *Transforming Higher Education: A Vision for Learning in the 21ˢ' Century.* (Ann Arbor, Michigan: Society for College and University Planning, 1995). http://www.umich.edu/~scup/

Griffiths, Jose-Marie and Donald W. King. *Special Libraries: Increasing the Information Edge.* (Washington, DC: Special Libraries Association, 1993).

Keller, Dean H. editor. *Academic Libraries in Greece: the Present Situation and Future Prospects.* (New York: Haworth Press, 1993).

King Research Ltd. *Library Information Series No. 18: Keys to Success: Performance Indicators for Public Libraries.* (London: HMSO, 1992).

Kyrillidou, Martha. *Developing   Indicators for Academic Library Performance: Ratios from the ARL Statistics 1993-94 and 1994-95.* (Washington, DC: Association of Research Libraries, 1996).

Kyrillidou, Martha. "NCES Describes U.S. Higher Education." *ARL: A Bimonthly Newsletter of Research Library Issues and Actions* 175 (July 1994): 4-5.

Lancaster, F. W. *If You Want to Evaluate your library.* (Champaign, EL: Graduate School of Library and Information Science, University of Illinois, 1993).

McClure, Charles and Cynthia L. Lopata. *Assessing the Academic Networked Environment: Strategies and Options.* (Washington DC: Coalition for Networked Information, 1996). http://www.cni.org

Poll, Roswitha and Peter te Boekhorst. *Measuring Quality: International Guidelines for Performance Measurement in Academic Libraries.* (London: K.G. Saur, 1996).

Stubbs, Kendon. "Service Trends Charted in Newly Released ARL Statistics". *ARL: A Bimonthly Newsletter of Research Library Issues and Actions* 185 (April 1996): 14.

William, Roberts. "The Making of Statistics of National Scope on American Libraries, 1836-1986: Purposes, Problems, and Issues". *Libraries and Culture* 26 (Spring 1991): 464-85.
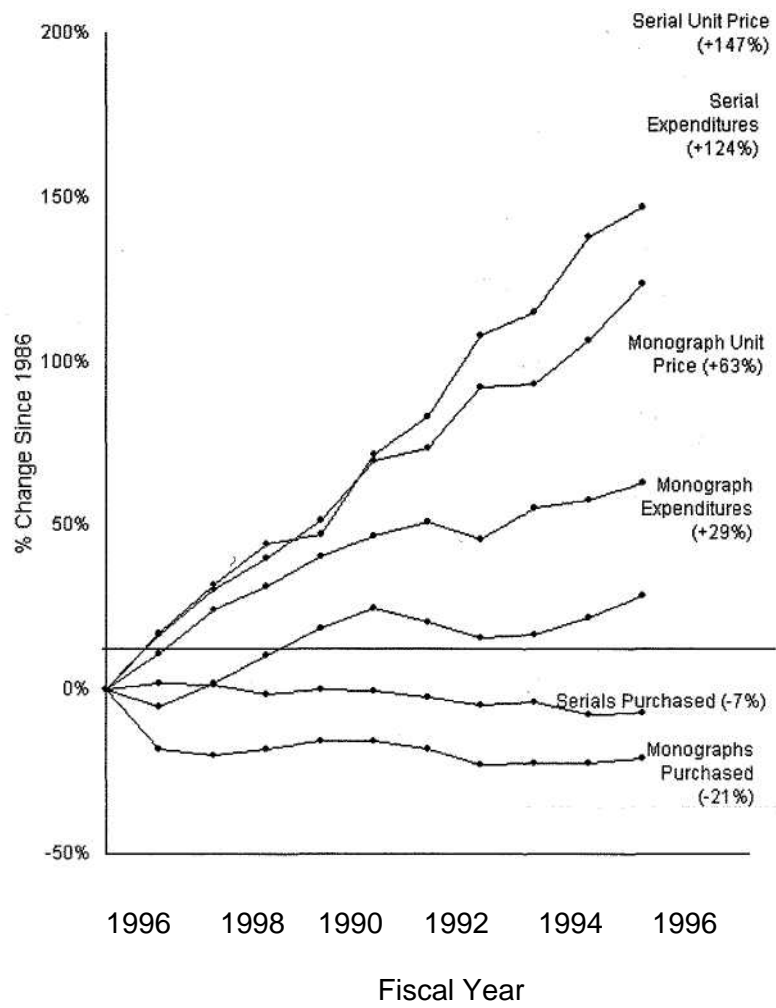
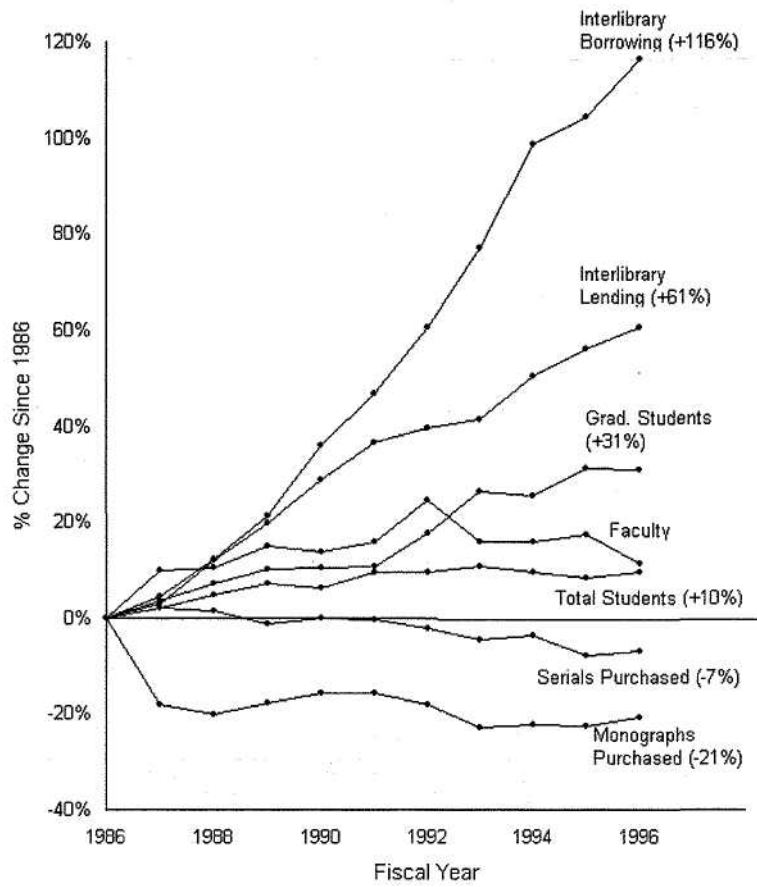*APPENDIX*

Graph 1
Service Trends in ARL Libraries, 1991-96
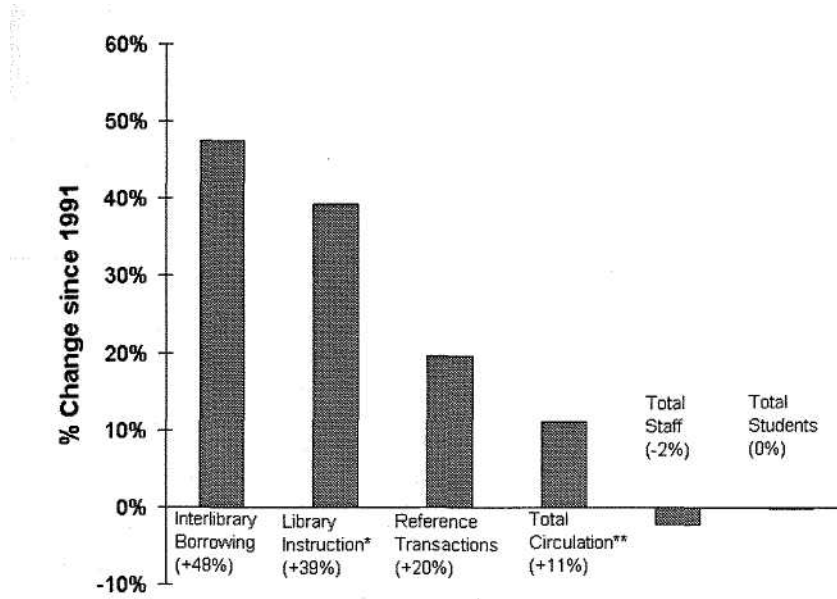
' Library Instruction represents the number of Group Presentations
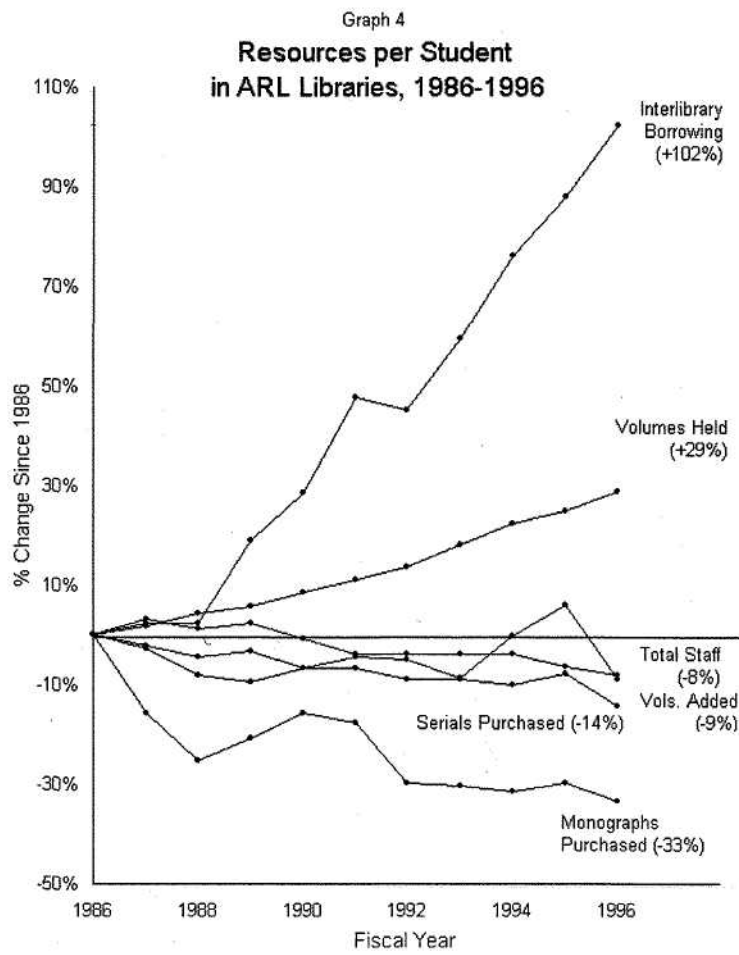"Total Circulation includes Initial and Renewals but excludes Reserve Circulation

Graph 2

Monograph and Serial Costs
in ARL Libraries, 1986-1996

Serial Unit Price
(+147%)

Serial
Expenditures
(+124%)

Monograph Unit
Price (+63%)

Monograph
Expenditures
(+29%)

Serials Purchased (-7%)

Monographs
Purchased
(-21%)

% Change Since 1986

200%

150%

100%

50%

0%

-50%

1996   1998   1990   1992   1994   1996

Fiscal Year

Supply and Demand
in ARL Libraries, 1986-1996

Graph 4
**Resources per Student
in ARL Libraries, 1986-1996**

Interlibrary
Borrowing
(+102%)

Volumes Held
(+29%)

Total Staff
(-8%)

Vols. Added
(-9%)

Serials Purchased (-14%)

Monographs
Purchased (-33%)

% Change Since 1986

110%

90%

70%

50%

30%

10%

-10%

-30%

-50%

1986   1988   1990   1992   1994   1996

Fiscal Year

Netscape - [ARL Graphics and Statistics]

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Location: http://www.lib.virginia.edu/socsci/newarl/

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Association of Research Libraries Statistics

Statistics have been collected and issued annually for the members of the Association of Research Libraries since 1961-62. Before that, annual statistics for university libraries had been collected by James Gerould, first at Minnesota and later at Princeton. These data cover the years 1907-08 through 1961-62, and are now called the Gerould statistics. The whole data series from 1908 to the present represents the oldest continuing library statistical series in North America. The current ARL statistics include data on collections, staffing, expenditures, library services, and library and university characteristics.

At present 1962-63--1995-96 data are available from these pages. You can list data for any of the current 109 academic ARL members, or you can

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