

Trends in U.S. Academic Libraries:
A Statistical Comparison of *The Academic Libraries Survey*
(1994-2004)

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ABSTRACT: With the goal of providing an overview of trends in U.S. academic libraries, this study compares and analyzes the statistical reports of the Academic Library Survey (ALS) from 1994 to 2004. The comparison covers survey results from the categories of library services and resources. The average biennial percentage changes have been calculated for selected data. Tables and graphics were created to illustrate the comparisons and enhance understanding of the trends. The retrospective and longitudinal comparisons indicate that the rapid and revolutionary changes in technology have impacted almost every facet of U.S. academic libraries. Based on these trends, it is predicted that in the future U.S. academic libraries will offer a mix of services and resources representing a hybrid of the "traditional" and "digital" library.

I. Introduction

The purpose of this study is to analyze the reports of the Academic Library Survey (ALS), conducted by the National Center for Education Statistics (NCES) of the U.S. Department of Education from 1994 to 2004, to compare selected results from the reports and to identify trends in U.S. academic libraries over the decade.

1. U.S. Academic Libraries Overview

According to the American Library Association (2007), in the United States today there are an estimated 117,467 libraries of all kinds, including public libraries, school libraries, special libraries, armed forces libraries, and government libraries. Although academic libraries, with 3,700 in total (Holton, 2006), constitute only a relatively small proportion of the U.S. library population, academic libraries occupy a central position on the campus of virtually every higher education institution (American Library Association, 2007).

An academic library, as defined by the ALS, is a library associated with a degree-granting institution of higher education. It is an entity in a post-secondary institution that provides all of the following:

- An organized collection of printed or other materials or a combination thereof
- A staff trained to provide and interpret such materials as required to meet the informational, cultural, recreational, or educational needs of clientele
- An established schedule in which services of the staff are available to clientele
- The physical facilities necessary to support such a collection, staff, and schedule.

The mission of an academic library, in general, is to provide quality services and resources in support of the teaching and research activities of the academic community.

The first academic library was created in the colonial period by John Harvard when he donated approximately 300 of his books to Harvard University in 1638 (Weiner 2005; Encyclopedia Britannica, 2007). At the beginning, the academic libraries were minimal and peripheral to the college function and mission. Academic libraries were developed in the nineteenth and early twentieth century by establishing a formal structure and the mission to serve students and faculty and to support more diversified curricula and research. In the twentieth century, academic libraries continued to evolve in response to changes in technology and society. With the explosive development of the Internet and the computer technologies at the beginning of the twenty-first century, the U.S. academic libraries have experienced revolutionary changes. The academic libraries are moving from the "traditional library" generation toward the "digital library" generation, and will emerge as even more central and vibrant resources for their institutions (American Library Association, 2007).

2. The Academic Libraries Survey

The Academic Library Survey (ALS) has been conducted by the National Center for Education Statistics (NCES) of U.S. Department of Education since 1966. The original purpose of the survey was to collect concise information on library resources, services, and expenditures for the entire population of academic libraries in the United States, which includes the libraries at 2-year and 4-year degree-granting, postsecondary institutions in the 50 U.S. states and the District of Columbia (Marston, 1999).

The content of the survey comprises 6-8 categories depending on the year of the survey. For example:

1994 Survey

Part A: Number of Public Service Outlets

Part B: Library Staff

Part C: Library Operation Expenditures

Part D: Library Collections

Part E: Library Services

Part F: Library Services, Typical Week

2004 Survey

Part A: Number of Public Service Outlets

Part B: Library Staff

Part C: Library Expenditures

Part D: Library Collections

Part E: Library Services

Part F: Library Services, Typical Week

Part G: Electronic Services

Part H: Information Literacy

Before 1988, ALS was collected at irregular intervals. Beginning in 1988, the data were collected biennially in even-number years. In 2000, the NCES introduced a web-based data collection system, which replaced the traditional paper form collection approach.

NCES has made ALS data and the comprehensive report available online to the public since 1998, and the latest ALS data and report are for the year of 2004.

Other surveys

A lot of efforts have been made to describe, evaluate, and measure the performances of the academic libraries in the U.S. In addition to ALS, there are several nation-wide surveys for academic libraries conducted by the different library associations:

- ARL Statistics

Association of Research Libraries (ARL) is a nonprofit organization of 123 research libraries at comprehensive, research-extensive institutions in the US and Canada that share similar research missions, aspirations, and achievements.

ARL Statistics is a series of annual publications that describe the collections, expenditures, staffing, and service activities for ARL member libraries. Statistics have been collected and published annually for the members of the Association since 1961-62.

- ACRL Academic Library Trends and Statistics Surveys

American College and Research Library (ACRL) has been collecting statistics from a small subset of academic libraries since 1979. The biennial report, ACRL University Library Statistics 19xx-19xx, is modeled on the annual ARL report and covers about 100 institutions that are not in ARL but are in Carnegie Classification Research I and II and Doctoral Granting I and II. In 1998 ACRL made a radical change and began soliciting data from all academic libraries in the United States and Canada using a web-based data collection method (Lynch, 2000).

Although conducted by different institutions for different group of academic libraries, the core set of data collected in Academic Libraries Survey, ARL Statistics, and ACRL Academic Library Trends and Statistics Surveys are very comparable, which all include questions on collections, expenditures, personnel, and public services.

In 2006, the ARL and ACRL Academic Library Trends and Statistics Surveys are identical. This effort reduced overlapping and duplicative processes to academic libraries on their data collection and report.

In order to help libraries better understand user's opinion about library service quality, a relatively new survey called LibQUAL+™ was introduced to the library field in 2000. Developed by the Association of Research Libraries (ARL) and Texas A&M University, LibQUAL+™ is a survey composed of 22 questions to measure library services from user perceptions.

Since 2000, more than 1,000 libraries have participated in LibQUAL+, including college and university libraries, community college libraries, health sciences libraries, academic law libraries, and public libraries. LibQUAL+™ has expanded internationally, with participating institutions in Africa, Australia, Asia, and Europe (Information about the LibQUAL+™ survey).

3. Literature Review

A review of literature found a lot of researches and information on library statistics and measurements. On his comprehensive web site of "Information Resources for Information Professionals" (<http://web.syr.edu/~jryan/infopro/index.html>), Joe Ryan compiled a special topic on "Library Statistics & Performance Measures". Multiple access points were created to make easy access to this rich clearinghouse on library statistics and measurements. From "Academic Library Statistics and Performance Measures" category, one can find major guides on academic library statistics and performance measurement from the leading professional organizations of American College and Research Library (ACRL) and Association of Research Libraries (ARL). The standards, guidelines, and programs related to academic library statistics from the major players like American College and Research Library (ACRL), Association of

Research Libraries (ARL), Council on Library and Information Resources (CLIR), Digital Library Foundation, International Coalition of Library Consortia (ICOLC), and the National Center for Education Statistics (NCES) can also be located from this web site. The bibliographies on related researches provide a useful reference sources to interested individuals.

The literature review did not find published articles especially addressing the overall comparison studies of academic libraries based on the statistical reports of the Academic Library Survey (ALS) from 1994 to 2004. However, the National Center for Education Statistics has published two reports on historical comparisons with the survey results from 1994 and 1996 respectively. Some of the comparison data can be traced back to 1974. Here are several interesting historical comparison data sets provided in the report of 1996 (Cahalan, 2001):

- Interlibrary loans received by academic libraries increased by 64 percent over the period between 1990 and 1996 (this increasing trend continued stably with 4.45% of average biennial change during the period of 1994 to 2004).
- Items borrowed increased 54 percent over the 6-year period from 1990 to 1996 per FTE student (the author's comparison study from 1994 to 2004 shows -2.71% of the average biennial change in total circulation transactions, which indicates a decline).
- In 1974, a total of 447 million volumes were counted in the nation's academic libraries and, by 1996, a total of 807 million volumes were counted (the author's comparison research from 1994 to 2004 shows 4.84% of the average biennial change in total volumes held, which indicates the same trend).
- The percentage of operating expenditures going to salaries and wages was 60% in 1974 and 50% in 1996 (during the period of 1994 to 2004, salary expenditures occupied 50% - 51% of total expenditures stably).

II. Methodology

The author reviewed and extracted the survey results data (1994 to 2004) from ALS, and compiled the data into a spreadsheet. To provide meaningful comparisons, the percentage ratios and their changes have been calculated for selected data.

The NCES Academic Library Project Advisory Committee periodically revises the survey form to reflect changes that have occurred in academic libraries (Holton, 2004). For this reason, the comparison of every data category for the entire period of 1994 to 2004 was not always possible. Therefore, the comparison was limited by the availability of the survey data. However, major new trends of recent years in library services and resources were identified and discussed even without complete data set.

The comparison was organized into two major categories "Library Services" and "Library Resources" each with its own subcategories:

- Library Services
 - Circulation
 - Interlibrary Loan
 - Group Presentations
 - Reference
 - New Trends in Library Services
- Library Resources
 - Staff
 - Collections
 - Expenditures
 - New Trends in Library Resources

A narrative comparison is provided based on the survey results. The tables and the graphics were created to illustrate the comparisons and to enhance understanding of the trends.

III. U.S. Academic Library Trends

1. Library Services

Table 1 provides a general picture of the library services in a typical week in U.S. academic libraries during years from 1994 to 2004. Approximately 42%- 45% of the libraries were open 60-79 hours per week during this period. A slightly lower percentage (38%-41%) of the libraries was open more than 80 hours per week. It is interesting to note that since 1998 there have been a very small number of academic libraries (around 20 -25 from 1998 to 2004) that provide a "never sleep" service: they have a 24-hours operating schedule every day.

For the surveyed libraries, the gate count during a typical week ranged from 17.8 million to 19.4 million during the period from 1994 to 2004, with a slight average biennial percentage increase of 1.99%. The number of library visits per total FTE (Full-Time Equivalent) enrollment ranged from 1.8 to 1.5 with an average biennial percentage decrease of 3.47%.

Table 1: Typical Weekly Service Trends in U.S. Academic Libraries (1994-2004)

Year	% of Libraries Open 60-79 Hrs/Week	% of Libraries Open >80 Hrs/Week	Gate Count/Week (Millions)	# of Visits/Week Per FTE Enrollment
1994	43%	41%	17.8	1.8
1996	44%	40%	16.5	1.6
1998	42%	38%	16.2	1.6
2000	44%	40%	16.5	1.6
2002	45%	40%	16.9	*1.5
2004	44%	38%	19.4	*1.5
Average Biennial Change (%)	0.20%	-1.44%	1.99%	-3.47%

* The original data were not available in 2002 and 2004 survey reports. The author calculated them by using available data from the ALS survey.

The traditional academic library services consist of circulation, interlibrary loan, group presentations, and reference. A snapshot of the selected services survey results with their average biennial percentage changes are presented in Table 2.

Table 2: Service Trends in U.S. Academic Libraries (1994-2004)

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Year	Circulation Transactions (Millions)	Total ILL* Transactions (Millions)	Presentations to Group	Total Presentations Attendance (Millions)	Reference Transactions/Week (Millions)
1994	231.5	15.1	487,000	6.1	2.1
1996	230.7	16.9	407,000	7.3	1.9
1998	216.1	16.9	438,000	7.4	2.1
2000	194.0	17.2	432,000	7.5	1.6
2002	189.2	17.6	452,023	8.0	1.5
2004	200.2	18.7	484,212	8.5	1.4
Average Biennial Change (%)	-2.71%	4.45%	0.32%	7.06%	-7.14%

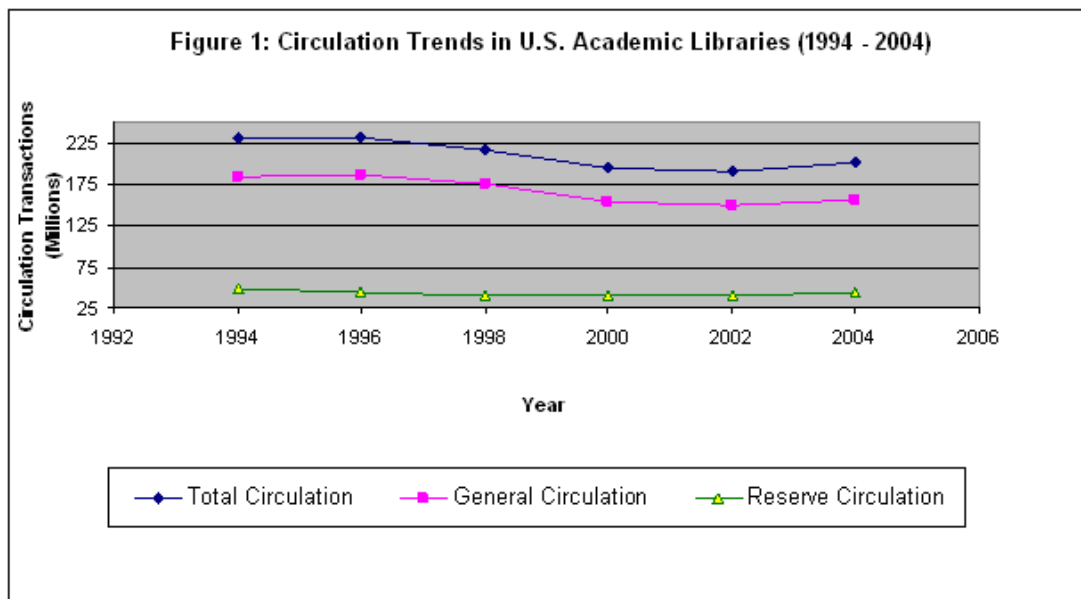
* ILL = Interlibrary Loan

1.1. Circulation

The total circulation transactions are the sum of the general circulation transactions and the reserve transactions. This number has been gradually declining over the

period of 1994-2004. The average biennial percentage change of the total circulation transactions over the period is -2.71%. The change in total circulation transactions over the period of 1994 - 2004 is almost perfectly correlated with the change in general circulation transactions, with a correlation of 0.98. They decreased from 1994 to 2002 but increased slightly between 2002 and 2004 (Figure 1).

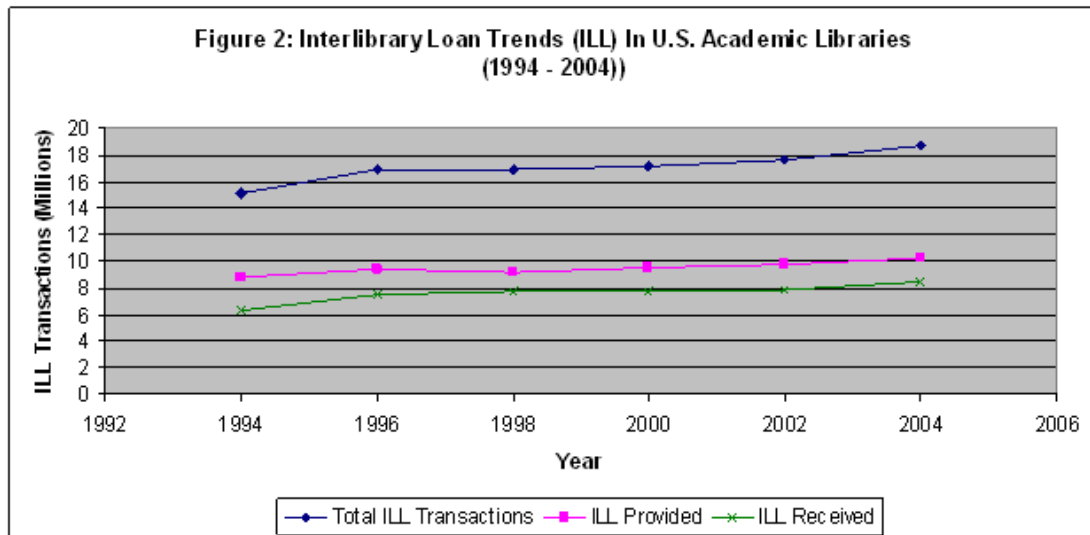
The decline of the circulation transactions indicates the impact of the increases of the electronic resources provided by the academic libraries.



1.2. Interlibrary Loan

Interlibrary loan is a service widely provided in U.S. academic libraries. The purpose of this service is for users to obtain materials (books, journal articles, and multimedia materials) that are needed for research and are not available at the home library but owned by another library. Thanks to the development of the library online catalog and the resource sharing network among libraries nation-wide and even world-wide, the interlibrary loan transactions in academic libraries has increased 23.8% from 1994 (15.1 million) to 2004 (18.7 million), with an average biennial percentage increase of 4.45% during the period of 1994 to 2004 (Table 2).

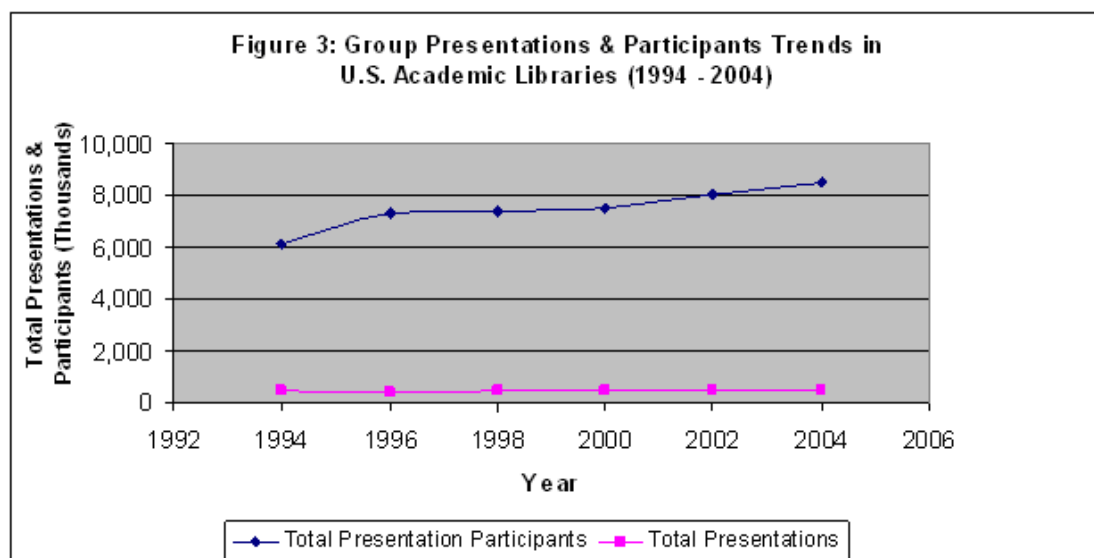
The interlibrary loan transactions trends, with the loans received and loans to other libraries are displayed in Figure 2.



1.3. Group Presentations

Group presentations, according to ALS instructions, include bibliographic instructions, library use presentations, cultural, recreational, or educational presentations provided by the library.

Although the total presentations given annually has increased only slightly from 1994 to 2004 with an average biennial percentage increase of 0.32%, the number of group presentations' participants has been increasing much faster than the total presentations offered, with an average biennial percentage growth of growth of 7.06% over the decade (Figure 3 and Table 2).



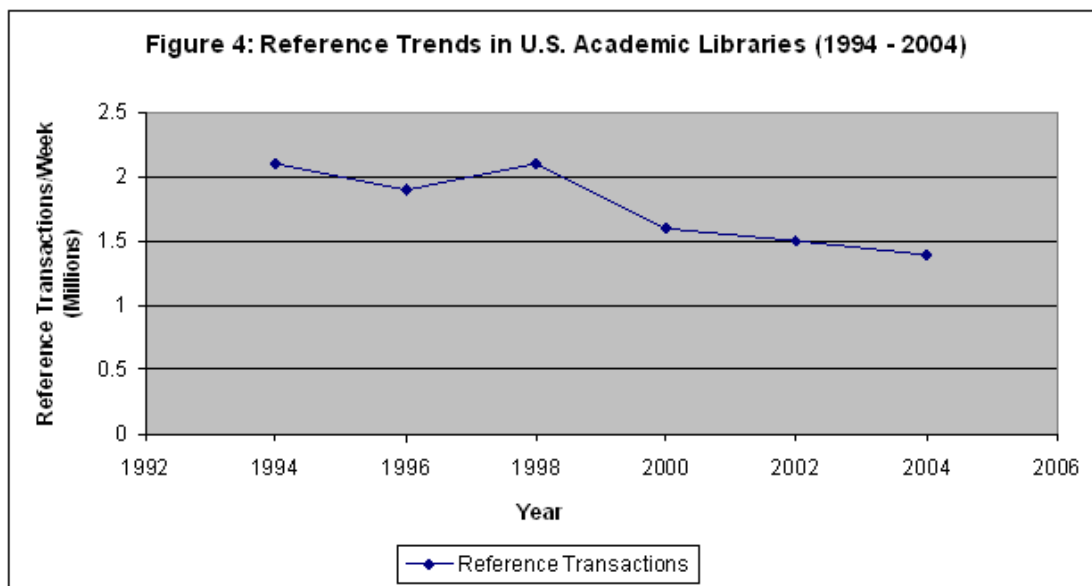
This unbalanced growth in the number of presentation participants related to the number of presentations may indicate an increase in capacity of facilities for the group presentations (such as library electronic classrooms).

1.4. Reference

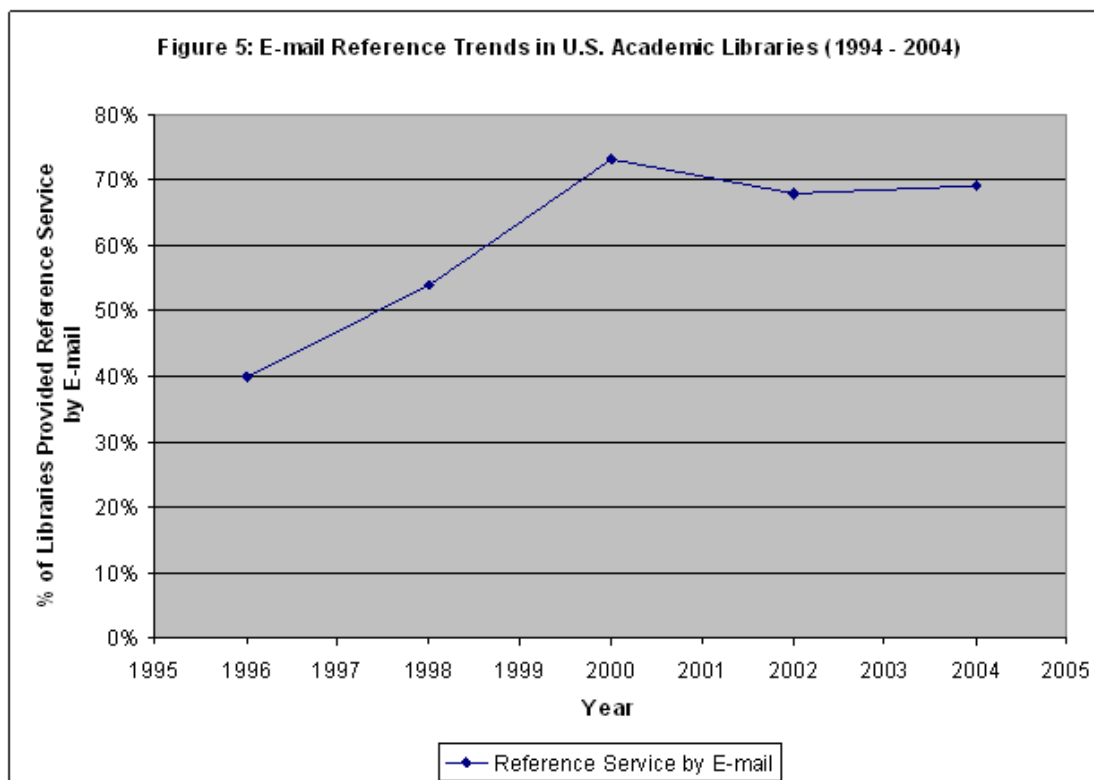
Reference service, the traditional face-to-face services of answering user questions by professional librarians, has changed in both transaction quantity and delivery format over the decade.

The survey results reveal significant changes in reference transactions over the period from 1994 to 2004. The number of reference transactions in a typical week has dropped from 2.1 million in 1994 to 1.4 million in 2004 (Figure 4), which represents an average biennial percentage change of -7.14% over the decade (Table 2).

While the reference transactions declined over the years, especially after 1998, e-mail and Web reference have become vital reference services in academic libraries. Starting from 1996, a new section on the ALS form was designed to capture information on the availability of a variety of library electronic services, and over a dozen new questions related to electronic services have been added to the survey. In addition to the existing questions regarding reference service, whether the library provides reference service by e-mail or the Web has become a standard question since 1996.



The percentage of the libraries that offered reference service by e-mail or the Web has grown from 40% in 1996 to 69% in 2004, with a peak of 73% in 2000 (Figure 5).



* 1994 data is not available

It is clear that the increase in e-mail reference service is an important factor contributing to the decline of reference transactions.

1.5. New Trends in Services

Beginning in 1996, the ALS survey has included an electronic services category. The content of this category has been changed (additions or deletions) over the years to reflect the extensive changes occurring in this area. The questions that have been addressed under this category provide a snapshot of service evolution over the years:

- Electronic catalog
- Electronic indexes and reference tools
- Electronic full text periodicals
- Electronic full text course reserves
- Internet access
- Library reference service by e-mail
- Capacity to place interlibrary loan/document delivery requests electronically
- Electronic document delivery
- Technology in the library to assist patrons with disabilities
- Video/desktop conferencing
- Satellite broadcasting
- Scanning equipment and services

- Distance education
- Consortial Services

Information literacy, a new concept born in the information age, has drawn more and more attention from U.S. educators and administrators, including librarians, as well as policy analysts and members of the general public, since the late twentieth century.

The concept of information literacy was established by the American Library Association's Presidential Committee on Information Literacy in 1989 (American Library Association, 1989). It is stated in the committee's final report that, "To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (American Library Association, 1989). The report outlined the importance of information literacy and explored opportunities to develop information literacy.

Advocating for and promoting information literacy has been a crucial challenge facing U.S. academic libraries over the decade. In 2000, the Association of College and Research Libraries (ACRL) developed the "Information Literacy Competency Standards for Higher Education" which provide guidelines for faculty and librarians on information literacy in higher education.

In 2004, a new set of questions on "information literacy" was added to the ALS questionnaire. The survey results of 2004 showed that approximately 34% of academic libraries reported that their postsecondary institutions had incorporated information literacy into their strategic plans, and about 21% had institution-wide committees to implement the strategic plans for information literacy during 2003-04.

2. Library Resources

2.1. Staff

The most valuable resource of academic libraries is the library staff. Traditionally, staff in U.S. academic libraries may be grouped into three categories:

- Librarians and other professional staff
- Technical and clerical staff (other paid staff)
- Student assistants.

Staff distribution between 1994 and 2004 is displayed by categories in Table 3. One may notice that the trend in number of staff over the period from 1994 to 2004, in general, is negative with an average biennial percentage change of -0.37%.

Although the total number of the library staff has decreased slightly from 95,843 in 1994 to 94,100 in 2004, the number of librarians and other professional staff has

increased gradually since 1994. The percentage of the librarian or other professional staff within the total library staff has increased from 27.9% in 1994 to 34.3% in 2004.

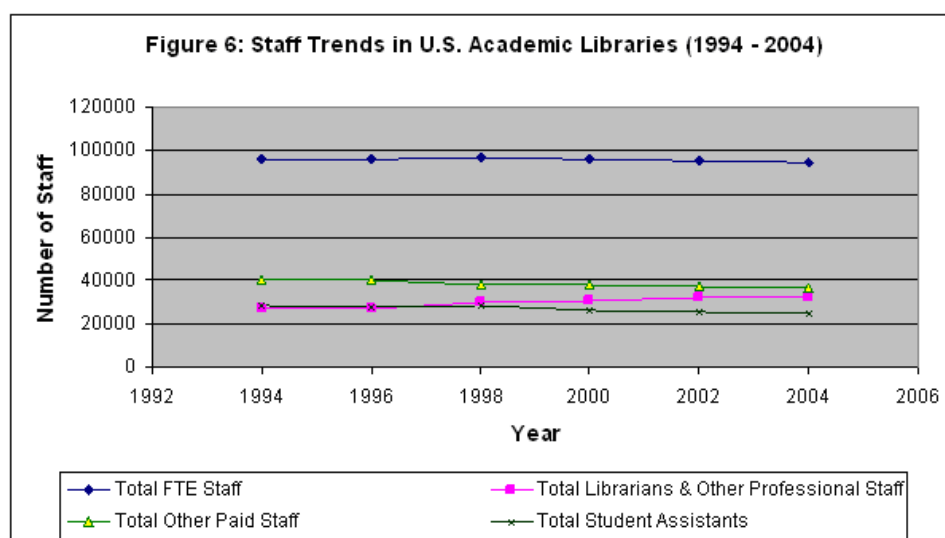
Numbers of other paid staff and student assistants over the period from 1994 to 2004, on the other hand, have declined with average biennial percentage decreases of 1.84% and 2.46%, respectively, which may be an indication of the budget strains on academic libraries.

Table 3: Staff Trends in U.S. Academic Libraries (1994-2004)

Year	Total FTE Staff	Librarians & Other Professionals	% of Librarians & Other Professionals/Total FTE Staff	Other Paid Staff	% of Other Paid Staff/Total FTE Staff	Student Assistants	% of Student Assistants/Total FTE Staff
*1994	95,943	26,726	27.9 %	40,381	42.1 %	28,411	29.6 %
*1996	95,580	27,268	28.5 %	40,022	41.9 %	27,998	29.3 %
*1998	96,709	30,041	31.1 %	38,026	39.3 %	28,373	29.3 %
*2000	95,665	31,016	32.4 %	37,899	39.6 %	26,521	27.7 %
2002	94,829	32,052	33.8 %	37,473	39.5 %	25,305	26.7 %
2004	94,085	32,280	34.3 %	36,767	39.1 %	25,038	26.6 %
Average Biennial Change (%)	-0.37%	3.90%	4.25%	-1.84%	-1.44%	-2.46%	-2.09%

* Contributed Service Staff data were collected under the Staff category from 1994 to 2000 of ALS, which occupied 0.3%, 0.3%, 0.3%, and 0.2% of total staff population in 1994, 1996, 1998, and 2000, respectively.

The trends in library staff are illustrated in Figure 6.



2.2. Collections

One of the traditional measurements of academic libraries, library collections, is composed of books, serials, microforms, and audiovisual materials. The total volumes held, including books, serial backfiles and other paper materials, have increased by 27% over the period of 1994 - 2004, with a 4.84% average biennial change (Table 4).

Electronic resources joined the array of library collections from the beginning of the twenty-first century. With the development of emerging technologies like e-readers, e-books collections have grown rapidly in U.S. academic libraries. Starting from 2002, ALS introduced questions on e-books and electronic reference sources and aggregation services to the survey under the Collections category (Table 4). Electronic reference sources and aggregation services include "citation indexes and abstracts, full-text reference sources, full-text journal and periodical article collection services, and dissertation and conference proceedings databases", according to ALS.

As shown in Table 4, the total e-books in the collections tripled from 2002 to 2004. The microforms collection, which includes microfilm, microfiche, and microprint, increased from 929.2 million units to 1,173.3 million units from 1994 to 2004, with an average biennial percentage change of 4.80%. Audiovisual materials have dropped slightly from 92.3 million in 1998 to 91.9 million in 2004. In 2004, a new category of electronic reference sources and aggregation services was reported, with 1.9 million in total.

Table 4: Collections Trends in U.S. Academic Libraries (1994-2004)

Year	Volumes Held (Millions)	E-Books (Millions)	Microforms (Millions)	Current Serial Subscriptions (Millions)	Audiovisual Materials (Millions)	E-Ref Sources & Aggregation Services (Millions)
1994	776.4	N/A	929.2	6.2	N/A	N/A
1996	806.7	N/A	1,015.7	5.7	N/A	N/A
1998	878.9	N/A	1,062.1	10.9	92.3	N/A
2000	913.5	N/A	1,111.5	7.5	87.6	N/A
2002	954.2	10.3	1,143.7	9.9	88.2	N/A
2004	982.6	32.8	1,173.3	12.8	91.9	1.9
Average Biennial Change (%)	4.84%	N/A	4.80%	22.65%	N/A	N/A

The big wave that impacted the library collection area over the decade is the significant increase in total current serials subscriptions (includes total number of subscriptions in all formats). It is reported that the total current serials subscriptions has more than doubled from 6.2 million in 1994 to 12.8 million in 2004, with an average biennial percentage change of 22.65% (Table 4).

King (2004) indicated that there is no question that scholarly journal prices, particularly in science and medicine, spiraled upward over the last twenty-year period during which print journals dominated. The common reason given for this is that commercial publishers, especially Elsevier, gained a monopolistic position in which market power allowed them to charge high prices. In addition to the inflation, a major contribution to the price increase is that the average size of science journals has increased by 80 percent over the last twenty-five years, thus requiring a similar increase in price. The high scholarly journal price is the cause of the increased expenditures on total current serials subscriptions.

2.3. Expenditures

The allocation of total library expenditures can be broken down into three categories: total salaries and wages, total information resources, and operating expenditures.

The amount allocated to each category and the ratio of each allocation to total expenditures can be found in Table 5. Total library expenditures have increased significantly over the period of 1994 to 2004 by almost 43%. The increase in salary expenditures and information resource expenditures has a strong correlation with the increase in total expenditures, where 50% -51% of the total expenditures is for salaries and 34%-38% of the total expenditures is for information resources (Figure 7 and Table 5).

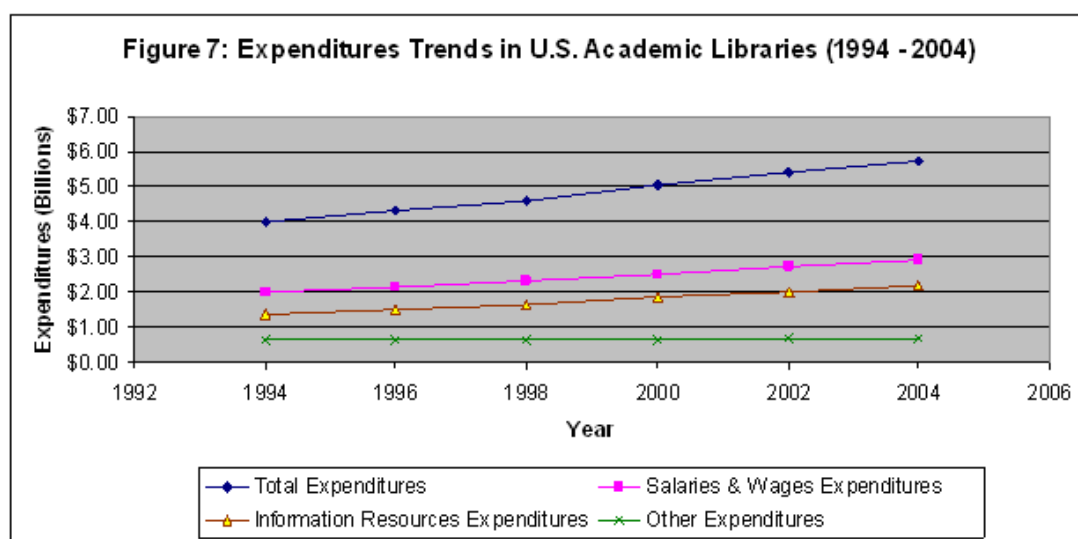
Table 5: Expenditures Trends in U.S. Academic Libraries (1994-2004)

Year	Total Exp. (Billions)	Salaries & Wages Exp. (Billions)	% of Salaries/Total Exp.	Information Res. Exp. (Billions)	% of Information Res./Total Exp.	Operating Exp. (Billions)	% of Operating Exp./Total Exp.	CPI
1994	\$4.01	\$2.02	50%	\$1.35	34%	\$0.64	16%	148.2
1996	\$4.30	\$2.15	50%	\$1.50	35%	\$0.65	15%	156.9
1998	\$4.59	\$2.31	50%	\$1.64	36%	\$0.64	14%	163.0
2000	\$5.03	\$2.52	50%	\$1.87	37%	\$0.64	13%	172.2
2002	\$5.42	\$2.75	51%	\$1.99	37%	\$0.67	13%	179.9
2004	\$5.75	\$2.91	51%	\$2.16	38%	\$0.68	12%	184.0
Aver. Biennial Change (%)	7.48%	7.58%	0.40%	9.89%	2.26%	1.24%	-5.55%	4.63%

In addition to salaries and wages, information resources expenditures occupy a big proportion of the total library expenditures. Information resources expenditures, as a percentage of total expenditures, increased from 34% to 38% during the period of 1994 to 2004, with an average biennial percentage change of 2.26%. Operating expenditures, the third category within the total expenditures, constituted 12% to 16% of the total expenditures over the decade. The rate of increase in operating expenditures was less than in salaries and wages or in information resources

expenditures. As a result, operating expenditures, as a portion of the total expenditures decreased over the decade, with an average biennial percentage change of -5.55% (Table 5). The Consumer Price Index (CPI) measures inflation as experienced by consumers in their day-to-day living expenses. The average biennial percentage change of CPI showing up in the last column of Table 5 provides a comparative reference with the average biennial percentage change of the total expenditures in the first column. This comparison reveals that the increase of the total expenditures during the period of 1994 to 2004, with an average biennial percentage change of 7.48%, is considerably above the inflation reference rates of 4.63% for the same period of time, with a difference of 2.85%.

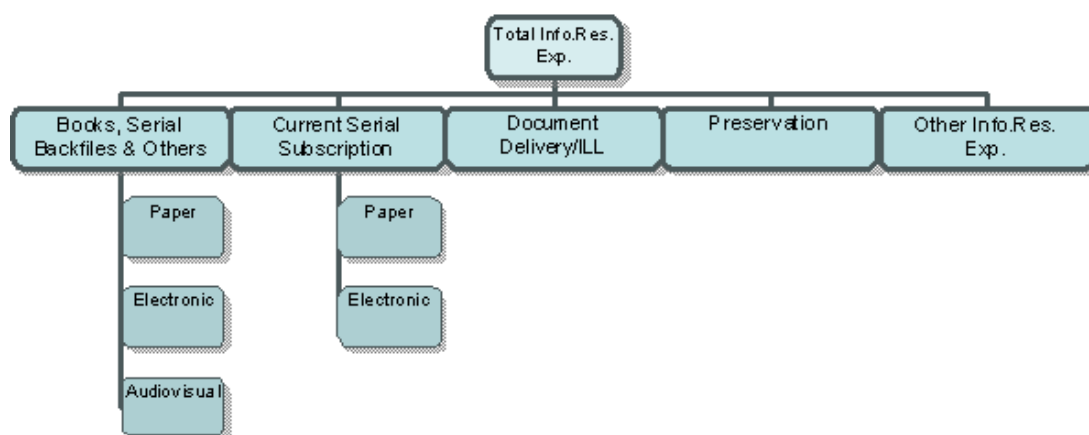
Figure 7 illustrates the expenditures trends during the period of 1994 to 2004.



Taking a closer look at the expenditures category from the questionnaire, one finds that academic libraries have invested more and more money on information resources, with a 9.89% average biennial percentage increase in total information resources expenditures over the decade. It is interesting to see the information resources trends in further subcategories.

As shown in Figure 8, the total expenditures on information resources may be broken down further into five subcategories for books, serial backfiles and other materials, current serial subscriptions, document delivery/interlibrary loan, preservation, and other expenditures for information resources.

Figure 8: Allocation of Information Resources Expenditures



The total expenditures on current serials subscriptions, the largest subcategory within the information resources expenditures, almost doubled from \$690.4 million in 1994 to \$1,363.7 million in 2004, with an average biennial percentage increase of 14.75% (Table 4). The rocketing price of serials subscriptions contributed to this marked growth.

Although document delivery/interlibrary loan expenditures was the smallest subcategory within the information resources expenditures, the budget academic libraries spent on this service has grown faster than any other subcategories, which was more than doubled, from 1994 to 2004. The average biennial rate of changes for this subcategory was 16.03% (Table 4).

Books and bound serials expenditures have grown constantly over the decade with an average biennial change of 8.13%, which indicate that books and other paper format sources will still occupy an important position in library collections.

Table 6: Information Resources Expenditures Trends in U.S. Academic Libraries (1994-2004)

Year	Total Info. Res. Exp. (Millions)	Books & Bound Serials Exp. (Millions)	Total Current Serials Sub. (Millions)	Audiovisual Exp. (Millions)	Document Delivery/ILL Exp. (Millions)	Preservation Exp. (Millions)
1994	\$1,348.9	\$442.5	\$690.4	\$28.8	\$12.2	\$46.6
1996	\$1,499.2	\$472.6	\$780.8	\$28.9	\$17.6	\$45.6
1998	\$1,643.9	\$542.1	\$974.9	\$30.6	\$19.3	\$42.9
2000	\$1,866.6	\$586.0	\$1,149.8	\$32.0	\$20.5	\$43.8
2002	\$1,991.0	\$644.8	\$1,223.8	\$37.0	\$22.9	\$46.5
2004	\$2,157.5	\$651.4	\$1,363.7	\$35.2	\$24.8	\$43.0
Aver. Biennial Change (%)	9.87%	8.13%	14.75%	4.31%	16.03%	-1.47%

2.4. New Trends in Resources

The survey data reveal the structural changes in library resources over the decade: more librarians and other professional staff joined academic libraries, and the spectrum of the library collection has been expanded in various formats.

The fast growing investment on interlibrary loan service expands the range of research materials for local libraries, and enhances the scholarship for teaching and research. It is also an indication of development of resource sharing, a trend in information age, in U.S. academic libraries.

IV. Conclusions

As the pioneers of the information age, U.S. academic libraries have evolved greatly in both services and resources areas, in response to the rapidly changing technologies and society from 1994 to 2004.

Although the total circulation and reference transactions have dropped gradually during the period of 1994-2004, the demand for access to information and knowledge from library users should not be underestimated. The constantly increasing interlibrary loan transactions and the number of enthusiastic participants in group presentations during the same period of time evidenced the growth of this demand. More and more users participating in group presentations may also be an indication that the need for information literacy skills is being addressed by academic librarians within the U.S. higher education system.

The positive trend in professional library staff shows that academic libraries have responded to the increasing demand and expectations of quality services from their users over the decade.

The significant increase of serials subscriptions constituted a big wave that lashed the academic library world over the decade. In the face of high user demand, U.S. academic libraries have struggled to balance sharply rising subscription prices and inadequate budgets.

It is also noted that despite the introduction of electronic resources to the U.S. academic libraries, traditional book collections have continued to expand.

Over the decade, U.S. academic libraries have experienced structural changes and diversification in their services and resources, including introduction of new service delivery formats. The challenges of emerging technologies like Web 2.0 and Google will be potent driving forces to reshape the libraries further.

We can predict that in the future U.S. academic libraries will offer a mix of services and resources representing a hybrid of the "traditional" and "digital" library, and will

continue to pursuit excellence in support of teaching and research within their academic community.

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