Library User Education: Examining Its Past, Projecting Its Future

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ABSTRACT

TECHNOLOGY, ECONOMIC FACTORS, AND changes in the educational system are major factors in what is being termed a "revolution" in libraries. Does library user education have a place in that future? Some believe that libraries would be more effective concentrating their resources elsewhere. To put library instruction in perspective requires a look at its past and the status of programs in terms of content, impact, and limitations.

INTRODUCTION

Dramatic changes in technology and society are having a considerable impact on libraries and their instruction programs. These changes have created an urgency to teach users how to become more effective, efficient, and independent in their information searching. In response to this, the goals of library user education have expanded from teaching tools to teaching concepts and from library instruction to information literacy and lifelong learning.

The Gateway to Information, developed by the Ohio State University (OSU) Library, is one response to the current issues and problems and those foreseen in the future of libraries and information. The Gateway to Information was designed to help undergraduate and graduate students identify, find, evaluate, and select the most useful information for their needs without help screens or handouts. The Gateway guides users in applying search strategy concepts and critical thinking to their information seeking.

Under development since 1987, The Gateway to Information has been continuously evaluated by users; revisions have been made based on the results of more than 7,000 evaluations. The Gateway is available on most

public terminals in the OSU library system. It will soon be accessible via the Internet and will integrate the sources of the Internet into its narrative. The information explosion has hastened the need for development of expert systems like this.

The unthinkable has become a reality. Libraries are being challenged as not relevant or necessary to the future of information. Current news and library literature specifically are replete with information and questions about the future of libraries. There has even been some speculation that the physical library may continue to exist but only as a sort of dinosaur museum.

If libraries do have a future, in what direction does it lie? Does library user education have a place in that future? Technology, economic factors, and changes in the educational system are major factors in what is being termed a "revolution" in libraries. One prediction about the future of libraries is that budget cuts will force the elimination of such "new" programs as library user education. In reality, the direction of information and libraries points to more emphasis on library user education. Also, when examined in the light of history, library user education is not a new service but a very old service predating even reference service.

How have libraries and librarians responded to the prediction of the death of libraries? In many ways their response has been impressive. In a steady stream of progress, libraries have developed and expanded programs to meet the changing needs of library users. Prominent among these is the library user education program. This is an examination of that steady progress and the move by librarians to prepare users for the continuing expansion of information. The Gateway to Information, developed at The Ohio State University Libraries, is described as one example of how libraries and librarians are responding to the demands of the future.

To put library user education in perspective requires a look at its past and present status. Is library user education an important activity? What programs and problems can be traced through its history? What are the content, teaching methods, evaluation studies, and problems of current programs? What has been the impact of these programs? What does the future hold for library user education? How are the factors of change affecting libraries and library user education? How can librarians respond to these changes? The Gateway to Information is offered as one response to, and portent of, the future. To explore these issues, a definition and outline of the objectives of library user education is needed.

Definition of Library User Education

Broadly defined, library user education (also called library instruction) teaches users how to make the most effective use of the library system.   At OSU, user education encompasses all activity undertaken to

help students become efficient users of information—i.e., how to identify
the information need and then how to find, evaluate, and select the best
information to meet that need. Activities to achieve that goal include
orientation sessions, workshops, handouts, and course-related and course-
integrated instruction. The term "library user education" has more re-
cently been broadened to include the concept of information literacy,
which will be defined later.

Objectives of Library User Education

Objectives for library instruction were established as early as 1881
when Otis Hall Robinson called for clarification of instructional goals at
the American Library Association conference. He wanted purposeful
instruction. As relevant today as they were a hundred years ago, three
important objectives were cited:

1. Students need to "develop the art of discrimination" to be
   able to judge the value of books to develop critical judg-
   ment;
2. Students need to become independent learners—to teach
   themselves;
3. Students need to continue to read and study—to become
   lifelong learners. (Tucker, 1979, p. 271)

From these objectives has recently come the idea of information literacy.

IMPORTANCE OF LIBRARY USER EDUCATION

Having defined library user education and some of its objectives, the
next issue is the importance of library user education. Does it make any
difference in how people use information? Does effective use of informa-
tion make a difference in people's lives? While debatable, there is a strong
belief that effective use of information is important. It has been said that
you will be mentally more powerful if you concentrate on how to find
knowledge rather than try to remember everything you have learned. It
is widely recognized that the ability to use information is extremely im-
portant in today's society and will continue to become more so.

Recognition of the importance of information and library user edu-
cation is found in *College: The Undergraduate Experience in America* by Boyer
(1987) and funded by the prestigious Carnegie Foundation for the Ad-
vancement of Teaching. This work is especially important to libraries
because it was the first major recent publication to mention and even
promote library user education. Boyer states:

> The college library must be viewed as a vital part of the undergradu-
> ate experience....The library staff should be considered as impor-
> tant to teaching as are classroom teachers. . . .We further recom-
> mend that every undergraduate student be introduced carefully to
> the full range of resources for learning on campus. Students should
> be given bibliographic instruction and be encouraged to spend at
> least as much time in the library—using its wide range of resources—
> as they spend in classes (pp. 164-65).

If instruction in the use of information is important, how successful have academic librarians been in developing library user education programs? Miller (1992) has said: "The concept of 'Bibliographic Instruction' appears to be one of the greatest success stories of modern American academic librarianship" (p. 140). However, many believe that the term and concept of library user education are not sufficient to carry the profession into the electronic age and that it must be expanded into the concept of information literacy. It is possible that expanding the concept to include information literacy may make it difficult to repeat the success of library user education of the past.

In summary, library user education can encompass a broad range of activities. Its need and importance have received increasing recognition to which librarians have responded with considerable success. There is some concern whether this success can be continued to encompass the broader concept of information literacy.

Background

To put library instruction in perspective requires a look at its past and present status. How did library user education get started? What programs and problems can be traced through its history? What has been the impact of these programs? What are the content, teaching methods, and problems of current programs?

The origins of library user education can be traced back more than 170 years. The earliest evidence of instruction—a librarian lecturing to undergraduates—was found at Harvard College in the 1820s. Most early academic librarians were professors with part-time library appointments who taught the use of libraries for academic purposes. Library lectures were the chosen form of instruction by such institutions as Harvard, Indiana University, and Columbia. Separate courses were implemented in the late 1800s by Ray Davis at the University of Michigan, Azariah Root at Oberlin College, and others. Over the next few years, about seventeen other institutions adopted instruction lectures or courses.

By 1900, six of the seventeen institutions examined were no longer providing library instruction, and by 1903, instruction had been dropped by two more institutions. These instruction activities existed from one to fifteen years with an average of about five and a half years (Hernon, 1982, p. 25). Why were these programs of such comparatively short tenure? In the 1860s, social changes and developing technology shaped education and its goals. These same factors led to the early rise and rapid decline of library instruction between 1870 and 1914.

As academic libraries grew in number, however, librarians became concerned about making collections accessible, and the importance of library instruction again became apparent. In the early 1900s, the resurgence was led by William Warner Bishop and William Frederick Poole

who espoused concepts of library instruction that are valid today. They wanted to make students independent learners and to clarify the role of the library in the university. In 1912, Bishop noted that librarians and professors were looking at methods of library instruction and doing some experimenting (Tucker, 1979, p. 273). These were largely individual efforts and did not result in established programs. There was some advocacy for course-related instruction instead of the separate course, but the concept was not developed.

Hopkins (1982) notes that, from 1876 to 1932, library instruction articles reflect a move from teaching the use of materials for research to instruction in access procedures. From 1907 on, some emphasis was given to teaching basic skills to first year students. Criticism of this freshman instruction began to surface in the late 1920s, deeming it shallow instruction. From 1945 to 1970, the increase in the production of knowledge and changes in higher education were similar to what had happened after the Civil War. Academic libraries underwent rapid collection growth and acquired new techniques of organization and retrieval. Librarians placed their major emphasis on rapidly growing collections which were the result of the increase in production of information and changes in higher education. In the 1950s, library instruction was eclipsed by the development in technical services. This was so pronounced that, in 1956, Jesse Shera advised librarians not to pursue the teaching role (pp. 194-95).

In the 1960s, two changes revived interest in library user education. Specialization had increased in education with more emphasis on content. At this time, Patricia Knapp introduced the concept of problem solving to library instruction. Concomitantly, a rapid democratization and increased complexity of libraries made information-seeking more difficult for students who were expected to cope with a system designed for faculty and graduate students. The instruction that developed in the 1960s and 1970s focused on access skills and bibliographic tools.

The establishment of the Library Orientation Exchange (LOEX) in 1973 with funding from the Council on Library Resources was a major step forward in the library instruction movement. Further impetus was given to the movement in the 1970s when the council funded programs to integrate academic libraries into undergraduate libraries. The program was based on Knapp's work, and CLR/NEH gave grants to thirty-six institutions "to explore innovative ways of enhancing the library's participation in the education process" (Gwinn, 1980, p. 7). With the arrival of the 1980s, emphasis in instruction shifted from teaching skills to applying concepts.

Current Status

What is the current status of library user education? What is being taught and which teaching methods and systems have been implemented in programs? What do evaluation studies show about the effectiveness of library user education? What are some problems common to these programs?

Content and Methods

Content covered and methods used are central to understanding the current status of user education programs. For more than a decade, the consensus has been that library user education should focus on the many sources of information available and not on the mechanics of using the system. Many instruction librarians have espoused, and continue to espouse, the search strategy approach because it provides a conceptual framework for teaching students research techniques. This idea has dominated library instruction since the mid 1970s because it is a simple and adaptable teaching framework. It teaches the use of different types of tools and resources and provides an outline for systematic information seeking that is broadly applicable, comprehensive, and time saving. In addition to teaching students how to find information, librarians now recognize the importance of teaching critical thinking skills to enable students to evaluate and select the best information for their needs.

Impact

What has been the impact of library instruction as measured in evaluation studies? There are two purposes for evaluation. One is to measure the effectiveness of instruction for guidance in how to improve the program (formative evaluation). The other is to measure the effect of library instruction on the students and their performance (summative evaluation). Most evaluation of library user education has been formative. Librarians have tended not to focus on evaluation studies that would demonstrate the impact of library instruction on student learning or attitude. Most evaluation studies done in the 1970s appear to fall into one of three methods: opinion surveys, knowledge testing, and library use observation.

Despite an apparent emphasis on formative evaluation, some librarians have tried to document a positive correlation between library use and proficiency and academic performance. In a study done in the late 1960s, Kramer and Kramer (1968) found a significant correlation between student use of the library and grade point average. They also found a correlation between length of time in school and library instruction. In a similar study done in the early 1980s, Selegean et al. (1983) examined the impact of instruction on grade point average, attendance at college, and graduation rates. Significant correlations were found between library instruction and grade point average and between library instruction and attendance.

In a 1982 study using a reliable and valid systematic evaluation design, Hardesty et al. (1982) and classroom faculty found that long-term possession of library-use skills is more related to library instruction than to inherent intellectual ability or academic diligence. Breivik's (1982) study indicated that library instruction correlated with higher course completion rates and term paper writing scores. She concluded that the

study did not show how well instruction helps students with library use, but there is a demonstrated correlation between library instruction and overall student academic performance.

Today there is an increasing demand for evaluation coming from outside the library profession. An example is the action of the state of Colorado which mandated in 1985 that institutions are "accountable for demonstrable improvements in student knowledge, capacities and skills between entrance and graduation" (Greer et al., 1991, p. 549). The law requires that institutions must identify goals and activities to meet those goals and evaluate student achievement. In response to this mandate, the library at Colorado State University has implemented some surveys and testing. However, lack of funding and staff have prevented the library from implementing a program of organized, sustained, and comprehensive instruction.

Challenges and Problems

Nearly thirty years ago, Palmer (1972) criticized librarians for instructing in a vacuum, over-emphasizing the card catalog, and relying too much on the one shot lecture. Palmer also said that librarians must look at the resources that go into instruction, equate that with the small number of students reached, and decide if that form of instruction is justified. Her advice was to teach students to find their way from where they are to where they want to go, using whatever method is suitable, and to teach for lifetime learning.

Course-related instruction has long been viewed as one of the most effective user education methods. A complication of course-related instruction, however, is the requirement for faculty cooperation and the faculty member's authority to decide when instruction is given and who receives it. In short, librarians have limited control over course-related instruction. These forms of instruction are also very staff-intensive, and this is exacerbated by the high ratio of students to librarians that exists in most institutions. These criticisms do not mean an abandonment of the teaching activities of the past, such as course-related instruction, but that librarians need to continue to look for additional ways of reaching students. Course-related instruction, workshops, and handouts are still viable means of teaching information-seeking skills.

The CLR/NEH program (referred to earlier) required close work with the faculty. Funded for three to five years, the total cost was more than $2.3 million. However, a study done in the late 1970s revealed that most of the programs no longer existed. The most common reasons for failure were staff turnover, lack of commitment from the library and institutional administrations, poor cooperation from the faculty, lack of adequate planning with faculty input, and insufficient evaluation studies. Involvement of the faculty depended on stipends which ceased when the grant ended. Staff energies and staff turnover affected programs. Other factors were lack of funding and failure by librarians to plan, prepare,

implement, and evaluate carefully their instruction programs. Gwinn (1980) concluded, however, that programs were having a positive effect on education even though progress was slow.

Miller (1978), in his study of programs of thirteen libraries, observed that alternatives to formal library instruction programs were point-of-use devices, expanded reference service, and written guides which, in his opinion, were the best alternatives if they were used. Another issue is where does the responsibility lie for developing and maintaining the user education program? Breivik (1982) believes that a growing program needs a single person with a defined role to provide leadership and handle the day-to-day issues. Carlson and Miller (1984) noted such problems as cost, faculty dependency, the challenges of teaching, and the difficulty of evaluation. Other complications they identified were the difficulty of achieving a balanced program and the inability of students to transfer library knowledge from one course to another.

More recently, Bessler (1990) postulated that perhaps users do know what is good for them and that service, not instruction, should be the goal. She believes that libraries that concentrate their resources on collections and services that patrons want will be more successful than those that focus their energy on instructing the patrons. Eadie (1990, 1992) goes even further in stating that reserve readings can be adequate for the information needs of most students and describes a library with minimal reference service as working well. Eadie believes that user education came into being not because users asked for it but because librarians thought it would be good for them.

Eadie points out that one reason for ineffective library instruction is lack of student motivation. He argues that the generic instruction session trivializes information gathering; that course-related instruction is simply oral bibliography; that audiovisual does not hold students' interest; and finally, that computer-assisted instruction is very time intensive to produce. Eadie believes handouts are all right if kept short and informal. He advocates a return to the 1960s where things were kept as simple as possible for most students, and personal service was provided for those who needed it.

However, these points of view fail to take into account that most library users are unaware of the quantity and variety of information available. They are often satisfied with materials that an experienced librarian would find wholly inadequate and/or inappropriate. Unless librarians educate users about finding information, users will continue to underutilize and misuse information. If librarians allow users to be satisfied with reserve lists and minimal reference help, they have abrogated their responsibility to ensure that users get the best information for their needs.

In summary, library user education goes back more than 150 years in American libraries. Activity has ebbed and flowed in that time for a variety of reasons. The current renaissance, which began in the 1960s,

has produced an increase in teaching activity and the expansion of instruction programs. Despite the increased growth of, and need for, instruction, the prevalent practices of library user education have limitations.

THE FUTURE

Objectives

Drucker (1994) has defined an educated person as someone "who has learned how to learn, and who continues learning, especially by formal education, throughout his or her lifetime" (pp. 66-67). Library user education programs need to support the concept of educating for a lifetime. In examining the future, what factors will affect change? What will be the impact on libraries and librarians? Finally, after we look at the future, a description of The Gateway to Information will show how and why it may be one response to the demands of future education programs.

"Information literacy will be essential for the growing cadre of knowledge workers in the 21st century" (Green & Gilbert, 1995, p. 23). Information literacy, which is now the avowed objective of most library user education programs, is an expansion of instruction as to objectives, materials, and methods. It has evolved in the way that instruction evolved from library orientation into bibliographic instruction. The Think Tank II report on bibliographic instruction defined "information literacy" as encompassing the entire world of information and seeking to prepare people to pursue the concept of lifelong learning. Information literacy extends its objectives to teaching information-seeking skills to all ages and at all times. It prepares people to use information effectively in any situation. There are no boundaries for information anywhere in any format. Information literacy may be defined as the ability to access and evaluate information effectively for problem solving and decision making. Information literate people know how to be lifelong learners in an information society (Rader & Coons, 1992, p. 113).

To achieve these goals, librarians and faculty will have to work closely together in developing teaching strategies using the latest technologies. One example of the integration of information literacy into the academic curriculum is found at Cleveland State University, where the curriculum has been rewritten to include an information literacy component. Librarians work with the faculty to include information literacy modules in courses. The library is implementing a comprehensive information literacy program that will include the teaching of critical thinking skills and evaluation of the program itself (Rader, 1990, p. 880).

The Middle States Association Commission on Higher Education has indicated in its "Framework for Outcomes Assessment," issued in 1991, that faculty should assume some responsibility, along with administrators,

librarians, and other information specialists, for information literacy for students. The statement implies that students need to acquire more complex information-seeking skills as they progress in their academic education. The commission statement indicates that this can best be done through partnerships across academe. The commission advocates examining course syllabi to determine how well the teaching of these skills is integrated into the curriculum.

Factors of Change

Drucker (1994) has said: "No century in recorded history has experienced so many social transformations and such radical ones as the twentieth century" (p. 53). As stated earlier, the enormous changes that are taking place have brought the very existence of libraries into question. What forces and environmental conditions will shape research libraries in the future? Clearly technology is a major factor in the changes that have been brought about in libraries over the last decade. Social factors have also played a large role in those changes and will continue to do so.

A few examples will illustrate the magnitude of the challenges of technological change. The quantity of scientific and technical data doubles every five and a half years but it is expected soon to double every twenty months. A digital global web of networks will make it possible to communicate with anyone, anywhere on the planet—forever altering work, play, our viewpoints, perceptions, etc. Drucker (1994) points out that digitization will make it possible to combine television, computers, and telephones (p. 55). When they merge, political and social changes will occur that are beyond our imagination. What is cutting-edge today will be passé tomorrow. For example, multimillion dollar vacuum-tube computers that were considered very impressive in the 1950s did not have the capability of the average pocket calculator of the 1990s. In 1956, the first transatlantic phone cable carried fifty compressed voice circuits. Now optical fibers carry 85,000—an increase of 170,000 percent.

Other examples of the rapid changes in technology are seen in the expansion of storage capability. In the past, a few hundred characters could be stored in a cubic inch; now that same space can hold billions of characters. Through the development of glass fibers, telegraphy has increased its capacity from fifty words per minute to billions of words in the same time. Processing has gone from hundreds to billions of instructions per second. However, a person's ability to process information remains at about 300 units per minute, as it has been from the beginning of time.

Of the social factors affecting libraries, the most obvious is the move in our society from a manufacturing base to an information base. Other factors are the increased emphasis on accountability; the changing demographic makeup of the United States; the increasing globalization of

our industries and institutions; and the shrinking of the domestic economy. Other factors are related specifically to libraries, including reductions in budgets; the development of electronic publishing; and increased user expectations. Overall, library budgets and internal systems have not kept up with the pace of change.

Impact on Libraries

How are these technological and social factors forcing libraries to change? Libraries will be required to offer more and better user services. Libraries must focus on access, not ownership, with more emphasis on delivery. Libraries must implement different forms of measurement. *Time for Results: The Governors' 1991 Report on Education* (National Governors' Association, 1986) examines how higher education outcomes are measured. The report states that measurement can no longer be by numbers of books in libraries or equipment in laboratories: student learning and performance must become the means of measurement (Rader & Coons, 1992, p. 110).

Libraries will attach more importance to locating and obtaining information and less to where the information is housed. Users will become less interested in the size of library collections and more concerned about the timeliness of document delivery. Libraries will be more access oriented and less size oriented. Libraries can no longer rely on the supposition that they are "good" for society and therefore deserving of support. Libraries will have to prove their value to users with emphasis on delivery of information rather than warehousing: the focus will need to be on output and not assets.

Users will no longer be satisfied with finding just citations to information; they will (and even now do) want the information itself. So far, technology has enabled us to do the same things we have always done, only better. But, in the future, technology will enable us to do different things better, and one of these will be to provide faster access to the information itself, not just the citation. As technology evolves, direct retrieval of text and image will become common.

There will be increased cooperation across all types of libraries. In the past, public and academic libraries have functioned as standalone operations but, in the next century, cooperation will become widespread among most libraries. New relationships will be developed among academic, school, public, and special libraries for the best use of resources. Academic libraries will need to become more closely coupled in planning and implementation with their institutions.

Impact on Programs

As collection development wanes in importance and access waxes, the teaching role of the library will become more important. Penniman (1992) cautions that librarians must shape the future, not let the future

shape them. He sees the challenge not as delivery of information but as ways of helping people understand and use it. Academic librarians must strive to have impact on the curricula of their institutions and, therefore, become more assertive and political in their actions. This can be achieved in several ways, among them: appointment to curriculum committees; meetings with administrators, deans, and heads of departments; and meetings with individual faculty members. Cleveland State University provides a good role model for integrating information literacy into the curriculum.

The increase in complexity of the information environment requires that librarians become proactive in teaching information skills. An expanded library user education program will include teaching the structure of information, use of new electronic formats, and applying critical thinking to information. [Librarians will have to maximize the use of technology to teach more skills to greater numbers of users. More complex expert systems will be developed to help users with in-depth use of complex abstracting and indexing services. The emphasis will be on problem-solving and on obtaining and accessing information rather than on ownership. User instruction will need to provide students and faculty with basic, intermediate, and advanced guidance in use of the library.]

Libraries will need increasingly to help users become more independent in locating and retrieving information. Users should be able to accomplish this using systems that are easy and transparent to use. To enable users to become more independent, librarians will need to develop user-friendly interfaces. Systems that are difficult to use place a strain on users and library services and are very staff-intensive for libraries to maintain. They require additional reference personnel to help users with logon and machine procedures, database selection, and search strategy formulation and modification.

As to methods, instruction should employ short modules that allow self-directed study with more emphasis on instructional content and less on the media used. The system should be one that users are comfortable in using and gives them a sense of control over it. Users should receive guidance on which resources are best for their needs, and basic instruction on search technique, and should feel assured that the system is not difficult and is evolving toward a more efficient, effective, and easy-to-use system.

McClure (1992) is concerned that users are already having serious problems with identifying and accessing resources in electronic networks. Some programmers, in writing instruction materiais, think users want the quantity of detail about the operation that they do. Rules that appear easy and straightforward to system people do not appear so to users. Many users will abandon a program rather than spend a few hours reading the manual. McClure says the key is to find out who the users are and design software for them. There is a great need for research from the user perspective so that user-friendly systems are developed in user-based system

design. McClure makes the point that users do not want to spend much time learning a system: they want to start using it. Then, as they become more experienced, they will see what they cannot do and look for improvement in the system or for more knowledge of how to use it. What this means for designers is that they must make the system simple to learn but expandable.

Criteria that need to be applied in developing user-friendly interfaces are identified in a study done at the University of Illinois. Mischo and DeSart (1989) found that users are enthusiastic about performing searches in easy-to-use systems but often have difficulty in performing effective searches. Users have serious problems with Boolean logic and search strategies, and they prefer CAI and one-on-one instruction to formal training sessions and printed instructions. They found that most end-users of online bibliographic systems search infrequently and never progress beyond the naïve user stage. So a system is needed that is easy to use but provides help with Boolean searching and search strategies.

Impact on Librarians

What does all this mean for librarians? Librarians will need to become more proactive and less reactive. Miller (1992) believes that, without a commitment to teaching, librarians will not be successful with information literacy and that, as collection development wanes in importance and access waxes, the teaching library is the natural route to go. He points to some hopeful conclusions. One is that many librarians know how to make sense of the complexity of information and translate it for users. Many librarians are gifted teachers and are the only group interested in, and capable of, helping students and others to find, synthesize, and interpret information. Librarians have a high degree of credibility in our society, and people are already accustomed to coming to them for help.

Librarians are the most capable of all professionals in analyzing user needs and meeting those needs effectively. Librarians are perceived as the ones responsible for instructing users in the effective use of electronic resources (and in critical thinking skills) to enable the users to select the best information for their needs. Librarians will need to be more involved with the development of user-friendly information systems.

THE GATEWAY TO INFORMATION

Description and Development

The Gateway to Information, developed by the Ohio State University Library, is one response to the current and future issues and problems facing libraries. The Gateway was designed to help undergraduate and graduate students identify, find, evaluate, and select the most useful information for their needs without the help of library staff. The goals of the project are to enable students to do the following:

1. find, evaluate, and select materials to meet their needs regardless of format;
2. access and integrate the content of online catalogs and CD-ROM databases easily; and
3. apply information-seeking and critical thinking skills independently.

The Gateway was designed as a front end to the library's online catalog and CD-ROMs and to provide guidance in choosing print materials. It was conceived as an online bridge with a common interface to electronic sources and guidance in helping students select the most relevant information for their needs regardless of format. It was also designed to provide direct access to sources for users who already know what they want.

Under development since 1987, The Gateway has been available on public terminals for more than five years. It has been continuously evaluated by users, and revisions have been made based on the results of more than 7,000 evaluations received. The Gateway is available on seventy-nine public terminals in the OSU library system. Based on the common concept of search strategy, its narrative is applicable to information searching at almost every level.

The Gateway was conceived as a partial solution to the dilemma faced by the Ohio State University Library. Recognizing that the proliferation of information had increased the need for students to become information literate, the library embarked on an intensive library user education program in 1978. The library administration and staff were convinced that, without instruction, most students would never learn how to use information, and they need to be taught systematic ways of finding information that produce better results more efficiently. Successful searching involves not only finding but also evaluating and selecting the most useful information.

The Ohio State University's library user education program in the 1980s was reaching more than 25,000 students a year with some form of course-related instruction and another 4,000 to 5,000 in workshops. These are large numbers of students, but the Columbus campus enrolls more than 53,000 students. The program was not reaching all students, and it was not providing the multiple sessions of instruction needed for students to become information literate.

Facing the challenge of teaching more students with the certainty that there would be no staff added to expand the program, the Library User Education Office considered how technology might fill the gap. Instruction in the program had centered on the concept of search strategy, which is a step-by-step process of moving from general to specific sources, evaluating the information, and selecting the most useful. As stated earlier, the simplicity and applicability of the search strategy concept has made it a major teaching tool since the 1970s. It was envisioned to design a system that put the search strategy concept on a computer so that users could find their information independently.

The Gateway provides instruction and guidance in identifying information needs, finding information to meet those needs, and providing help in evaluating and selecting the best information regardless of material format. The Gateway is so clearly written that no help screens, handouts, or workshops are needed to use it. The user can find the information needed independently without the help of library staff. The Gateway combines the use of the online catalog, CD-ROMs, and print materials. While originally designed for undergraduates, The Gateway was never meant to remain solely at that level. In fact, over one-third of its usage has been by graduate students. The Gateway is intended ultimately to serve equally undergraduate and graduate students, faculty, and staff.

Macintosh HyperCard was used to create the narrative of The Gateway because it offered the easiest method for implementation and its ability to make the continuous anticipated revisions. The ability to update both information sources and the narrative was incorporated into the project's design. The Gateway team recognized that the project must be designed to keep pace with an always changing environment of information systems and information itself. The Gateway was placed on Apple Macintosh IICX computers using HyperCard, MAC/TCP, and Mitemview. It was served by twenty databases housed in CD-ROM towers connected to a local area network.

A common interface to the databases was created and new databases were added as they became available. The narrative recommended the best information available for a specific need regardless of format. The Gateway was to use technology but not be driven by it. The Gateway also has an evaluation section designed to help students evaluate authors, books, and journals. Reminders to use the evaluation section are embedded within the narrative. A notebook section allows users to "save" their materials in a notebook and print from that.

The project team was determined to make The Gateway a user-driven system. The plan was to create the narrative and let users respond to it. The responses were collected by paper evaluations, observation, and interviews. The Gateway has undergone the continuous revisions anticipated. Evaluations span more than four years, from July 1990 through January 1995. These 7,943 evaluations indicate that 81 percent of the respondents found The Gateway very or mostly easy to use. Seventy-eight percent rated their use of The Gateway completely or mostly successful, and 82 percent indicated they would use The Gateway again. The project team believes that the continuous revision of The Gateway, based on the evaluations, has significantly improved it. Some sample comments from the evaluations are:

> Thanks for your successful work.
>
> It does the assignment for you.

This is a great program! I'm going to take advantage of this
and use it all of the time.

More indexes.

More things on the Gateway

The Gateway has also been evaluated by special classes, including a
graduate education class and two industrial design classes. Evaluation
results have had considerable impact on revisions and additions to The
Gateway. The early screens had much good information on them, but
observation and interviews indicated that students did not read the screens.
Students would not read more than two lines, and they preferred to skim
text. Consequently, the content of the narrative was drastically reduced
and simplified.

A sample search can illustrate how a student might use The Gateway
to find information. Assigned a five-page paper on advertising, our hypo-
thetical student begins her search at a Gateway terminal. The opening
screen offers several options: time-saving research strategies; encyclope-
dias; dictionaries; periodical articles; catalogs; reviews; biography; statis-
tics; library information; evaluation. Since she has a topic but is unsure
how to proceed, she selects time-saving research strategies. The next
screen offers choices in choosing or narrowing a topic, analyzing infor-
mation needs, and sample strategies. She selects the section which tells
how to narrow a topic. This recommends background information found
in encyclopedias.

The next step takes her to the general encyclopedia section, which
provides a subject approach to print encyclopedias and *Groliers Electronic
Encyclopedia.* She selects the electronic encyclopedia and types in the term
"advertising," which brings up a lengthy article with a bibliography. After
reading it, she pushes the "save to notebook" button. This puts the ar-
ticle in the student's electronic notebook which can be printed anytime
the student chooses.

After reading the encyclopedia article, she decides to narrow her
topic to women in advertising. She goes back to the main screen and
decides to look for periodical articles. She types in the term "advertis-
ing" and five indexes are recommended for searching. She selects *Wilson
Business Abstracts* and, after reading a few of the abstracts, decides to search
for the terms "advertising" and "gender." With additional reading of the
abstracts, she narrows her topic further to women in television advertis-
ing and adds the term "television" to the search. This search results in a
very manageable four entries.

With book and article titles from the encyclopedia article and the
Wilson search, the student now returns to the main menu and selects the
catalog button to search for journals and books. She searches the catalog
for the journals she needs and finds where they are in the library system.

She then does a subject search for books, typing in "women" and "advertising"; the response shows there are seven books in the library. She selects a title that is in the Women's Studies library and, being unfamiliar with that library, she clicks on the name and is connected to information showing the location of the library and giving the hours it is open. She can find the libraries that have the journals she needs in the same way.

If the student finds references to people or requires statistics, she can go to those sections from the main menu screen. Most Gateway screens provide several options. In addition to the buttons specific to each screen, three buttons are common to screens that refer to titles/resources. These buttons are related to notebook and evaluation functions. The notebook buttons are "save to notebook" and "view notebook." These functions enable students to save information for future printing and view at any time what they have placed in their notebooks. The third is "evaluate sources." This option is placed prominently on most screens to encourage students to evaluate the information they are finding. It reminds the student to evaluate the author's reputation by referring her to specific biographical sources. It also recommends sources for evaluating books and journals.

Thus the student has narrowed her topic, found and evaluated materials on the topic, and identified where they are in the library system. If she has questions about these locations, she can refer to the library information section on the main menu; this option provides information on library locations, major holdings, policies, hours, maps, and floor plans. A campus map is a particularly popular feature.

The Future of the Gateway

The Gateway is, in many ways, an ongoing project. The narrative will continue to be expanded and the number of databases and workstations will be increased. Special sections on communication, business, and women's studies are already on The Gateway. These sections, which were written by the bibliographers in those subjects, are intended for advanced undergraduate and graduate students. Additional subject sections are already being written.

The technology of The Gateway is undergoing a complete change. The technology used to support The Gateway is now outdated, and its new technology will offer greater capabilities and many new benefits. The Gateway narrative is being written in HTML language for Netscape and will be placed on the library's World Wide Web (WWW). A prototype will be up for testing in summer 1995.

This move will stabilize Gateway's technology, making it accessible by a variety of computers both inside and outside the library. Another benefit of this move is that changes in the narrative will not have to be made by a programmer but can be made by library staff. This will make

changing the narrative and keeping it up to date a much simpler matter than it has been in the past. Front-ending databases and the catalog will no longer be possible so the user will be guided to the appropriate source and then, if it is electronic, will be able to use the native version. Migrating The Gateway to a WWW using Netscape will make it possible to integrate the Internet smoothly into the narrative sources. These changes in The Gateway's technology will make it transferable to other institutions with a minimum of time and effort.

The Gateway as a Response to the Present and Future

How does The Gateway relate to problems and weaknesses of past programs? Studies have shown that, to be effective, instruction must be given at the time students need to use information. In an attempt to meet this requirement, librarians have turned to the development of audiovisual tools. These tools have several drawbacks. They are expensive to develop and maintain, are not usually transferable to other institutions, and are easily outdated. The Gateway provides help for the user at the time of need.

Another major criticism of instruction is that the number of students reached does not justify the staff time required. The Gateway relieves the staff of much of the basic instruction and provides some higher level instruction too, all without handouts or help screens. A further limitation of current methods is the perceived lack of transference of knowledge from one library lecture to the needs of other course assignments. Studies have shown that students often do not know how to apply, or even remember, information-seeking skills acquired from one course when doing assignments for subsequent courses. The Gateway relieves the student of the necessity to remember information skills by providing instruction whenever she begins her search. The Gateway is self-help, which studies have shown is the preferred method of instruction over handouts and workshops.

Current emphasis in user education is on the importance of teaching concepts such as search strategy and critical thinking. The Gateway is based on the search strategy concept. The Gateway's evaluation section integrates the application of critical thinking skills into the narrative wherever possible. Emphasis today is on lifelong learning. Students must become independent learners and then lifelong learners. The Gateway helps the user to become independent.

Studies have shown that library user education should focus on the many sources of information available and not on the mechanics of using the system. The Gateway provides its guidance/instruction without the need for handouts or help screens. The consensus is that instruction should involve short modules that allow self-directed study. The Gateway provides short and long modules and allows users complete control over their searching. Instructional content is more important than the medium used. The emphasis in Gateway's development has been on the instructional guide called "the narrative," not on its technology.

Libraries will increasingly need to help users find and retrieve information themselves easily and transparently. The system that would best meet the needs of users has been described as one that makes users comfortable with using it, gives them a sense of control over it, and provides guidance on which resources are best for their needs. It would provide basic instruction on search techniques, including Boolean searching, and would assure users that the system is not difficult and is evolving toward a more efficient, effective, and easy-to-use system. The Gateway's evaluations demonstrates that it meets all these criteria.

Library user education should provide basic, intermediate, and advanced guidance in the use of the library for students and faculty. The Gateway provides basic and intermediate and will ultimately provide advanced guidance. Systems of the future need to be designed from the perspective of the user with easy straightforward rules and should be user friendly. The Gateway is a user-based system that has been developed, revised, and expanded based on user evaluation. The Gateway meets the fundamental criterion of a system that is simple to learn but is expandable.

CONCLUSION

Technological and social factors are bringing vast changes to information and its access with considerable impact on libraries and librarians. In response to this, librarians are applying the changes to broaden objectives for teaching the use of information. The Gateway is one example of this response, overcoming many limitations of today's user education programs and positioned to meet the challenges of the future. Development of expert systems like The Gateway needs to be accelerated.

These are exciting times. Librarians must move fast to seize the opportunities and break out of the molds of the past. They must be visionary, innovative, and flexible in meeting the challenges of the future.

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