Managing Change: Supporting Users of Automated Systems

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Rapidly evolving technology is bringing change to academic libraries in unprecedented ways. One strategy for managing the changes due to online integrated library systems is to provide user and staff training. A review of the training literature and the results of three projects for supporting patron use of this system are presented. Results indicate that academic library patrons have little trouble using such systems and respond favorably to all modes of training. The results suggest that training should focus on generic strategies for information seeking rather than on the functional use of integrated library systems.

entral to all American libraries is providing access to information, a mission typically met through the acquisition and systematic organization of published materials. The organization is reflected in orderly tools, such as catalogs, which offer users means to identify what is locally owned. With the development of electronic integrated library systems this bibliographic control often becomes a powerful intermediary for connecting the users' needs and the library's holdings through multiple access points. Moreover, electronic systems have the potential to extend users' information-seeking capabilities beyond local holdings. The introduction of new technologies and techniques for information processing is a double-edged sword. It promises to improve efficiency and effectiveness in handling information for librarians and patrons alike, but it also brings the stresses of change due to new patterns of behavior, equipment failure, and new ways of thinking. Managing the change related to automation has emerged as a central concern of librarians today. A natural and logical response to this concern is to provide training and support services for staff and patrons. This article describes three research efforts related to an automated library system and discusses their implications for patron support services in academic libraries.

LIBRARY INSTRUCTION

Most American academic libraries accept the obligation of providing instruction as part of their mission. A distinction is often made between user orientation to local resources and services and bibliographic instruction for library research methods. Both types of instruction must include introduction to and use of online tools through which a user can meet specific information needs.

As machine-readable library databases become available through campuswide networks connecting powerful work stations, the library's traditional instructional role may be challenged and certainly will be changed. Computer center staff also see patron assistance as a natural extension of their mission. Debates and cooperative efforts are emerging as librarians and computer center personnel try to resolve their traditional functions in light of new technological developments.[1]

It is essential that libraries provide effec-

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tive instruction and assistance at the comfort level as well as the competence level. To provide such instruction, methods and materials that are customized for adult learners in an academic setting must be developed and integrated with existing methods and materials. Everyone agrees that support services specific to electronic information systems be provided; what is not clear is how best to structure, deliver, and evaluate these services.

Population and Content

Foremost in any instructional plan is consideration of the client population. In academic libraries, the clients are adults who are generally intelligent and knowledgeable about information services. Research in adult learning indicates that adults vary greatly in capabilities, are self-directed learners, have large and formalized knowledge bases, carefully consider the investment of time in learning, and learn from a variety of media.[2] These results should guide the design of training procedures and materials for users of academic libraries. Short, intensive units that are individualized and delivered in a variety of formats are best for these learners.

Since materials of this nature can be expensive to develop and maintain, it is essential that the amount and type of content be carefully considered. Attention to information-seeking strategies and judging relevancy should be the ultimate goals of most user training, not the mechanics of using a particular index or system. As the studies described below demonstrate, attention to the mechanics of using automated systems in the context of an academic library does not optimize library resources or users' learning time. Instructions for using a system can be effectively and inexpensively provided through the provision of easily accessible, self-directed materials. Various media are available for this purpose and considerable research has been conducted on the role of media in delivering instruction.

Instructional Media

Researchers in many disciplines have conducted investigations comparing the effectiveness of various media for instruction. Research summaries of media selection report no conclusive evidence for the effectiveness of various media.[3] R. Clark even suggests that the medium makes no difference in learning.[4] Robert Reiser and Robert Gagne present an overview of models used for selecting media for instructional purposes in which they suggest that the specific instructional variables included in the model contribute a bias for the eventual determination of media.[5] Considering the number and complexity of the variables involved, it is not surprising that conclusive evidence has not been found.

There have been many studies of instructional media particular to library instruction. Most have involved library skills instruction, and there is little doubt that this is effective and useful for students.[6] Comparative examinations of different media have also been conducted. Frank Kuo compared six modes of instruction for library skills and concluded that simply adding visual support to instruction did not affect learning, and an audiovisual presentation supplemented by a librarian was superior to self-directed audiovisual instruction.[7] Since time on task was not controlled, these results are not surprising.

Julia Baldwin and Robert Rudolph compared slide/tape to guided tour instruction with no conclusive results.[8] Timothy Jewell compared self-paced workbook instruction to media-assisted lectures and found that students generally favored workbooks.[9] Other researchers found use of programmed instruction books superior to the lecture method in teaching bibliographic skills.[10]

Susan Rawlins found no statistically significant differences between computer-assisted instruction (CAI) and lecture but students reacted more favorably to CAI.[11] M. Guilfoyle noted that student assistants felt CAI was a good way to learn library skills.[12] Maria Sugranes and James Neal evaluated a self-instruction course with favorable results but made no formal comparisons.[13] After reviewing various instructional media, Nancy Fjällbrant and Ian Malley conclude, "In practice a combi-

nation of teaching methods and media can be expected to provide the best basis for programmes of library user education, different methods being adapted to different parts of the programme and to the teachers and students concerned."[14]

Overall, there is no conclusive evidence from psychology, education, or library science that one mode of instruction is superior to another in providing instruction, although attitudes toward nontraditional methods are reported to be superior. Taken as a whole, the evidence suggests that differences in learning are more likely due to interactions among individual characteristics, subject matter, and media. A pragmatic approach would be to provide a variety of media and allow the learner to choose which to use.

THE STUDIES

In an environment such as the campus of the University of Maryland at College Park, the responsibility to provide training in using the online integrated library system, including the public query feature of the circulation system and the online catalog, is a natural extension of the library's traditional role of offering both bibliographic instruction and user orientation. During the 1984–85 academic year three studies of the university's integrated library system were conducted. In one, patron instruction was the primary interest, in another, patron use was examined, and in the third, staff support service for patrons was considered.

Learning to Use the Online Circulation System

A comparative experiment was conducted in spring 1985 to determine which of three modes of instruction was superior in introducing library users to a newly implemented online circulation system and to relate each of these modes to individual characteristics. The research was sponsored by the Council on Library Resources and the full report is available as an ERIC document.[15] A brief summary of procedures and results follows.

An instructional sequence or script was written, which presented an overview of the integrated library system and gave detailed instruction for using the online cir-

culation subsystem. The functions targeted for instruction were searching for an item by author, title, or call number; placing a hold; and obtaining patron information. Examples were selected to illustrate both concepts and procedures and sample screen displays were prepared. The script was evaluated for accuracy and clarity by public services staff in the campus libraries and revised as necessary.

The script was used to develop three parallel modules, each using a distinct mode of instruction. The three modes were printed text, videotape, and interactive (hands-on). The text version was simply the original script with example screen displays embedded at appropriate places. The interactive version used the same text but subjects actually worked through the examples at a terminal by using the text in a "cookbook" fashion. The video version consisted of a narration of the script with actual screen displays shown as examples.

An achievement test was designed to measure procedural (what to do), interpretative (what does a screen mean), and general (what is included in the database) knowledge about the system.

A demographic section was appended to the final instrument. A total of fifty-one subjects, mostly graduate library science students, were assigned to one of the three treatment groups. Each subject had twenty minutes to use the instructional unit and ten minutes to complete the achievement test. Individual characteristics considered in the study were gender, previous computer experience (five-point scale), previous online circulation experience with the system studied (two-point scale), previous online circulation experience with other systems (two-point scale), age, and native language.

In general, subjects were able to master the use of the online circulation subsystem regardless of the mode of instruction. The overall mean score on the achievement test was 87 percent. A one-way analysis of variance across treatment groups resulted in no statistically significant differences ($F = 2.81$, $p > .05$) among the three instructional modes. A weak relationship (Spearman $r = .22$, $p > .05$) was found between treatment and willingness to use the system in the future. Subjects in the

interactive group were most likely to use the system in the future, with the videotape group least likely to use it in the future. No statistically significant correlations between individual characteristics and achievement were found.

The results of this study suggest that patron instructional needs for using an online circulation system can be met with a variety of short, introductory modules that are freely available for individual patron use.

Searching the Online Public Access Catalog

Also sponsored by the Council on Library Resources, this study explored user search behavior when using an online public access catalog (OPAC).[16] One of the purposes of the study was to develop an experience base for the design and evaluation of OPAC training methods and materials. Both search patterns and search results were examined with respect to individual characteristics of subjects. Search patterns were also related to the system's user interface.

Thirty-nine subjects, mostly graduate library science students (but not any who participated in the previous study), were given thirty minutes to conduct two researcher-assigned searches using the OPAC. One search was simple and focused and the other was complex and open-ended. No instruction in using the system was provided and users had no previous experience with the OPAC. All user keystrokes and system responses were captured in the system's log file. A relevancy score based upon the research team's judgments was computed for each search. Subject searches that exhibited a variety of access methods (e.g. subject, author, keyword, etc.) were classified as heterogeneous searches and those that contained a single access method were termed homogeneous. Together with questionnaire responses upon completion of the searches, these user/system interactions served as raw data for examination of search patterns and search results.

About two-thirds of the subjects used homogeneous search patterns, and no statistically significant (at .05 level) correlations were found between individual characteristics and search pattern. Subjects were generally successful on the criterion measures of number of hits, relevancy score, and satisfaction with results. No statistically significant (.05) correlations between individual characteristics and success measures were found. Overall, subjects found the system to be easy to use and very seldom used the help function. Although some suggestions were made for improving the command set and screen displays and making command summaries available near the stations, subjects found the system to be easy to use even with no instruction. It should be noted that Boolean search capabilities were not yet implemented at the time the study was conducted.

Based on the results, substantial resource investments in training materials seems imprudent. However, command summaries should be available at the terminals and short, introductory modules in a variety of media formats could be made available for independent patron use.

User Assistance Survey

Another method for managing the introduction of an integrated library system is to assign library staff to areas where terminals are placed so introductions can be given and questions answered. Because this can be expensive and can divert staff from other functions, a pilot interview/survey was conducted in the fall 1985 semester to determine whether patrons used or required personnel dedicated to the online system.

An interview protocol was developed and used with randomly selected users to assess their satisfaction, success, and perceptions about ease of use. After using the system, subjects were also given an opportunity to have a graduate library science student reconduct their search for them. Of the sixteen users interviewed, two-thirds were successful in finding information they sought even though half of the respondents had never used the system before. All users said that the system was easy to use, and only one user asked to have the search augmented by the interviewer.

Only one-third of the respondents who used the OPAC looked in the card catalog,

serials list, or other sources in addition to the OPAC. This is significant because at the time of the study the OPAC did not contain all items in the card catalog. Signs pointing this out were prominently displayed. This study suggests that full-time staff need not be assigned to the terminal area. It does reinforce the need to help patrons look beyond the integrated library system for comprehensive information and suggests that library instruction focus on the many sources of information available in academic libraries rather than on the mechanics of using a particular system.

CONCLUSIONS AND RECOMMENDATIONS

It is clear from these studies that users in an academic library are ready and able to use integrated library systems with little formal training with respect to the mechanics of using electronic equipment and systems. What is needed is library instruction that stresses the various sources of data available both locally and remotely; strategies for searching electronic systems, e.g., broadening and narrowing tactics, using synonyms, and differentiating between full-text, numeric, and bibliographic databases; and ways of judging relevancy. The particulars of using a system, e.g., what keys to press for an author search or what masking or truncation key to use, can easily be provided with flip charts or posters available near the work stations.

A second recommendation is that instructional modules that address topics users need help with should be provided in short, intensive units and in a variety of media that allow self-directed study. It is not the medium that makes a difference, but the instructional content. Providing a variety of media may help attract a wider range of users to the system.

It must be noted that systems are becoming easier for uninitiated patrons to use, and although this suggests the need for less staff assistance in *how* to use the system, it does not diminish the need for staff assistance in *when* to use the system and *what* the results of using the system mean. The ease of getting some response—regardless of how incomplete it may be—seems to generate a false credibility that the system's response is adequate or even comprehensive. This challenges librarians to raise users' consciousness, to stir curiosity in the incompleteness of our controls over the wealth of information available, and to raise self-confidence in their need to know. These are the real challenges of change that must be met by academic libraries.

One thing is certain, change will continue. We are in the midst of a transition period as users increase their interaction with machine-readable databases. Since these databases are not yet fully developed and new ones are emerging, most libraries are required to make simultaneous use of electronic and manual systems. Search languages are not standardized, let alone natural language-like, and are sure to change as pseudointelligent front ends and gateways evolve.

In the midst of these changes, the focus of the academic librarian should be to provide settings and tones that induce comfort and a sense of human control over systems; guidance on what resources most effectively meet various information retrieval needs; basic instruction on search techniques; and assurance that the entire process is not difficult and is evolving toward more efficient, effective, and easy-to-use systems. Such demands may not allow for the most thorough examination of every nuance of use of online systems, but should be met with greater flexibility and attitude conditioning to cope with and welcome inevitable change.

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