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1.0 Introduction

A popular theme in current library literature is the electronic academic library. Characteristics of this emerging library include locally loaded databases; graphics, imaging, and multimedia; networking; and graphical user interfaces (GUIs). [1] Additional trends in academic libraries include a move toward client/server computing and the collaboration of libraries with other technology units on campus. [2] Only a few years ago the local online catalog seemed to be a minor miracle to library users; now, hundreds of OPACs (Online Public Access Catalogs) are available for worldwide access via the Internet. The explosion of networked information has contributed to an age of vast transformation in which librarianship as a profession is "caught in the swiftest and most encompassing changes--faster and more drastic than any other." [3]

At the same time that these transformations are taking place within libraries, faculty members are also changing. During the microcomputer revolution of the 1980s, faculty in all disciplines became more computer literate. [4] In addition, the results of surveys such as the one conducted by the State University of New York (SUNY) indicate that faculty make use of an online catalog on a frequent basis, and many would like to be able to initiate library transactions from home. [5] These results suggest that faculty find electronic library resources useful and would use such services if offered.

In spite of the fact that faculty today are better equipped to use information technology than their predecessors, there are still many obstacles to overcome in order to retrieve and manage the growing amount of online information that has become available. Moreover, the growth in electronic publishing creates a need for new skills by users in searching full-text, and in some cases multimedia- and hypermedia-based electronic resources. This trend also reinforces the need for traditional computer skills, such as wordprocessing, text editing, searching databases, and using multiple search interfaces. End users trained in the use of computers, the Internet, and information finding, can retrieve, search, and manipulate information electronically, and are better equipped to find information to suit their needs independently. [6]

Because information technology is so closely related to computer technology, there is growing interest in the cooperation of the academic library and the computer center to provide services. Many campuses have developed an information technology infrastructure, which Rosser and Penrod described as including the following elements: a campus-wide communications network; an

application architecture; and discipline-oriented databases. [7] Ideally, such infrastructures are made available at the desktop of each member of the university community. Libraries and computer centers need each other to support such campus infrastructures and to maximize declining institutional resources. [8]

In the area of user instruction, it is becoming increasingly difficult to stay abreast of rapidly changing technology in order to instruct others in how to retrieve electronic information, let alone how to manage the digital information once it is retrieved. Kiesler states that the more specialized and technical work becomes, the more important it is that people collaborate and exchange knowledge. Otherwise, they may not be able to keep up with innovations or changes in techniques. [9]

This paper reports the results of a survey which was conducted to explore the relationship between faculty use of university libraries and faculty use of computers. Implications for libraries are also discussed in relation to the findings--in the areas of computer databases, faculty assistance, collaboration with computing staff, and marketing of electronic services.

2.0 Description of the Study

Western Michigan University (WMU) is a Doctoral I university, as defined by the Carnegie Commission on Higher Education, with a student head count enrollment of 19,499 undergraduates and 6,174 graduate students. The University Libraries consist of a main library building and three branch libraries, altogether containing more than 3.2 million volumes and with access to over 75 electronic databases.

Western Michigan University faculty were surveyed in 1994 to gather information regarding library use, computer use, and attitudes toward computing. The survey was sent to the entire population of 742 faculty members, and the single wave produced an overall response rate of 42.3 percent (314 completed survey forms). Characteristics of the sample were compared to the known population characteristics of professorial rank, age, and academic college (see Table 1). Although there were small differences between the sample distributions and the population distributions (e.g., fewer full professors and faculty without college affiliations in the sample), none of the differences were statistically significant.

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The Libraries' electronic environment during the time the survey was conducted included several online catalogs and approximately 55 databases. Approximately 36 of these databases were made available through a subscription to the OCLC FirstSearch system; in addition, there was a subscription to the CARL UnCover service, several locally mounted tape-loaded databases, and approximately 20 CD-ROM titles. All of the online catalogs and databases, with the exception of the CD-ROM titles, were available for remote access. It is estimated, however, that less than two-thirds of the faculty had direct connections to these services in their departments. Since the time of the survey, the University has made progress in making network connections available to all faculty members requesting them.

Table 1. Rank, Age, and Academic College of WMU Faculty

	Population	Sample
Rank		
Professor	44.0%	36.0%
Associate Professor	27.0	31.9
Assistant Professor	24.0	27.4
Instructor	5.0	4.7
	100.0	100.0
Age		
Less than 30 years	2.0%	1.5%
30-39 years	17.0	17.9
40-49 years	30.0	31.7
50-59 years	40.0	33.7
60 years or older	11.0	15.2
	100.0	100.0
College		
Arts and Sciences	39.0%	39.5%
Business	8.0	12.3
Education	8.0	12.0
Engineering and Applied Sciences	6.0	4.2
Fine Arts	7.0	9.8
Health and Human Services	5.0	7.5
No college affiliation	27.0	14.7
	100.0	100.0

3.0 General Library Use by Faculty

One set of items in the survey instrument dealt with faculty use of services offered by the University Libraries. A clear majority of the faculty at WMU who answered the survey reported regular use of the library (see Table 2). For example, at least 80 percent of them reported that they use the non-electronic services of the University Libraries. This includes working or studying in one of the campus libraries, borrowing materials an average of once a month, and asking questions of the reference librarians somewhat less than once a month.

Table 2. Faculty Use of Library Services

Library Services	% Users	Average Usage Level*
Non-Electronic Services		
Borrow materials	85.4%	3.03
Use reference staff	82.5%	2.49

Work/study in library	79.6%	3.02
Electronic Services		
Use electronic databases	62.9%	2.56
Use WMU online catalog	61.2%	3.63
Use other online catalogs	59.7%	2.48
Use CD-ROM databases	45.2%	1.97

* Scale: 1 = not at all, 2 = less than once per month, 3 = once per month, 4 = a few times per month, 5 = weekly, and 6 = daily.

In the area of library electronic services, approximately 60 percent of the faculty answering the survey reported using the WMU online catalog several times a month. Approximately the same percentage of faculty reported use of online electronic databases and other online catalogs, but used these services less often (less than once a month). On the other hand, only 45 percent of the respondents reported using CD-ROM databases at all, averaging less than once a month.

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Are there different factors among faculty which relate to frequency of library use? Table 3 shows a clear pattern of differences in use across faculty ranks. In all cases, except for the use of reference staff, assistant professors reported the highest level of use and full professors reported the lowest level of use. While the differences among the ranks are relatively small in magnitude, the overall pattern is clear. Senior faculty used the library less than junior faculty.

Table 3. Faculty Use of Library Services by Rank

Library Services	Professor	Associate	Assistant
Non-Electronic Services			
Borrow materials	2.99	3.09	3.12
Use reference staff	2.60	2.41	2.49
Work/study in library	2.94	3.07	3.15
Electronic Services			
Use electronic databases	2.15	2.82	3.00
Use WMU online catalog	3.51	3.68	3.91
Use other online catalogs	2.21	2.61	2.81
Use CD-ROM databases	1.72	2.01	2.28

* Scale: 1 = not at all, 2 = less than once per month, 3 = once per month, 4 = a few times per month, 5 = weekly, and 6 = daily.

A comparison of WMU's faculty library survey results with a similar study conducted with the four campuses of the SUNY system found similar usage patterns. The SUNY survey found proportions of faculty who reported using CD-ROM databases and other institutions' online catalogs similar to the percentages found at WMU. [10] The SUNY survey found that 70 percent of the faculty respondents reported using various online electronic databases; this was slightly above WMU's 63 percent.

The biggest difference, however, was in the percentages of faculty reporting use of the online catalog. More than 90 percent of the faculty respondents at SUNY reported using their institution's online catalog, while only 61 percent of faculty respondents at WMU reported using their library's online catalog. The authors are unsure of the reason for this 30 percent difference, beyond the limited number of faculty members having access to network connections in their campus offices at the time that the survey was done.

4.0 Library Index and Statistical Methods

An "index of library use" was created to distinguish among the various frequencies of library use. All of the items from the survey dealing with use of the WMU Libraries were combined to form an index. The index allowed the authors to classify faculty either as Infrequent Library Users (ILUs)--the lower one-third of the library index distribution--or as Frequent Library Users (FLUs)--the upper one-third of the distribution. The scale used to answer each question ranged from one equaling "Not At All" to six equaling "Almost Every Day." Thus, the scores could range from seven to 42. The distribution of the Library Index scores is shown in Figure 1, and clearly displays a wide range of use among faculty.

Figure 1. Distribution of Library Index Scores

[This figure is only available in the HTML version of this article.]

The two groups of library users (Infrequent and Frequent) were compared to determine if significant differences existed between them in relation to usage of computers. Chi-square tests were performed to determine the significance of any relationships. A probability of .05 or less was used to determine the statistical significance of any differences between Infrequent and Frequent Library Users.

5.0 Research Findings

Findings for the study are grouped to focus on (1) use of types of computer applications, (2) computer-based writing, (3) use of computers, and (4) attitudes toward computing.

5.1 Library Use Frequency and Types of Computer Applications

The study explored faculty use of a number of common computer applications, as well as self-reported expertise in their use. Analysis indicated that there were significant differences between the Infrequent and Frequent Library Users in relation to several of those applications (see Table 4). The most striking connections were found with the use of email for on-campus and off-campus communications and the use of databases to search for books and references. Frequent Library Users were far more likely to use these services than Infrequent Library Users.

Similarly, Frequent Library Users were more likely than Infrequent Library Users to use statistical packages, bulletin board systems, and data collection applications, as well as to download files. No significant differences were found between library user groups with respect to computer programming, graphics, music, system installation, and desktop publishing applications.

Table 4. Frequency of Library Use and Use of Computer Applications

Application	Usage Level of ILUs*	Usage Level of FLUs
Email on-campus	2.99	4.02***
Search databases	2.07	3.71***
Email off-campus	2.42	3.49***
Statistics	2.15	2.57**
Bulletin board systems	1.65	2.47***
Data collection	1.55	2.17***
Downloading files	1.43	1.94**

* Scale: 1 = not at all, 2 = less than once per month, 3 = once per month, 4 = a few times per month, 5 = weekly, and 6 = daily.

** Probability less than .05.

*** Probability less than .01.

Comparisons between the two groups of faculty respondents were also made for self-reported expertise with various computer applications (see Table 5). Reported expertise in the use of

three computer applications--email, database searching, and statistical packages--showed significant differences, with Frequent Library Users reporting higher levels of expertise than Infrequent Library Users. No significant differences were found between these user groups for reported expertise in computer programming, graphics, music, system installation, and desktop publishing applications.

Table 5. Frequency of Library Use and Reported Computer Expertise

Application	Expertise of ILUs*	Expertise of FLUs
Email	2.80	3.55***
Search databases	1.99	2.61***
Statistics	1.82	2.42**

* Scale: 1 = expert, 2 = good, 3 = average, 4 = novice, and 5 = none.

** Probability less than .05.

*** Probability less than .01.

5.2 Frequency of Library Use and Computer-based Writing

On most university campuses, computers and the university library are considered important elements in the support of writing. In this study, significant differences were found between Frequent and Infrequent Library Users with regard to the use of computers for various writing-related tasks. These differences suggest a relationship between using the university library and using a computer for writing (see Table 6).

Frequent Library Users make significantly greater use of the computer for writing academic and personal papers, preparing teaching materials, and composing throughout the writing process. While the difference is not statistically significant, it is interesting to note that a substantially larger percentage of Frequent Library Users utilized computers for 100% of their writing than did Infrequent Library Users.

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Table 6. Frequency of Library Use and Writing with Computers

Practice	Usage Level of ILUs*	Usage Level of FLUs
Use computers to write academic papers	3.62	4.51***
Use computers to write personal papers	3.66	4.28***

Use computers to prepare course materials	3.55	3.72***
Use computers throughout the writing process	3.81	4.43**

* Scale: 1 = not at all, 2 = less than once per month, 3 = once per month, 4 = a few times per month, 5 = weekly, and 6 = daily.

** Probability less than .05.

*** Probability less than .01.

Significant differences also emerged between the two groups of library users with regard to their preferences for various writing practices. Frequent Library Users were more likely to use computers for creating first drafts than Infrequent Library Users, who preferred using longhand (see Table 7). Collaborative writing among faculty members was also found to differ significantly, with Frequent Library Users more likely to collaborate in this way than Infrequent Library Users. Collaborative writing between faculty and students and preparing an outline before writing were practices that did not show significant differences between user groups.

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Table 7. Frequency of Library Use and Writing Preferences

Preference	Usage Level of ILUs*	Usage Level of FLUs
First draft on computer	3.79	4.51***
First draft longhand	2.33	1.71**
Collaborative writing among instructors	2.32	2.77**

* Scale: 1 = never, 2 = seldom, 3 = occasionally, 4 = frequently, and 5 = always.

** Probability less than .05.

*** Probability less than .01.

Self-reported computer writing expertise was also explored; statistically significant differences were found between the two groups of library users (see Table 8). Faculty self-reported expertise in the use of word processors was higher for Frequent Library Users, as was self-reported expertise in the use of text editors. (Both groups, however, reported expertise in text editor use in the range of the "novice" level.)

Table 8. Frequency of Library Use and Reported Computer Writing Expertise

Application	Expertise of ILUs*	Expertise of FLUs
Text editor	4.31	3.50***
Word processor	2.28	1.83**

* Scale: 1 = expert, 2 = good, 3 = average, 4 = novice, and 5 = none.

** Probability less than .05.

*** Probability less than .01.

5.3 Library Use and Use of Computers

Do the type of computers faculty use and the total hours of use relate to use of the library? A statistically significant connection (to the .01 level) was found with overall hours of computer use, with Frequent Library Users averaging 26.5 hours of computer use per week. Infrequent Library Users, on the other hand, used computers an average of 15.93 hours per week.

Differences also emerged in the types and locations of computers used. For example, Frequent Library Users were found to use the mainframe computer and portable/laptop computers significantly more than Infrequent Library Users (see Table 9). In addition, Frequent Library Users reported using computers in University labs and in their offices significantly more than Infrequent Library Users.

Table 9. Computer Use and Frequency of Library Use

Computer Type/Location	Usage Level of ILUs*	Usage Level of FLUs
Use academic mainframe	1.72	1.90***
Use portable/laptop	1.61	1.72***
Use in University lab	1.42	1.72***
Use in office	3.77	4.24**

* Scale: 1 = never, 2 = seldom, 3 = occasionally, 4 = frequently, and 5 = always.

** Probability less than .05.

*** Probability less than .01.

5.4 Library Use and Attitudes Toward Computers

The survey contained a variety of items intended to elicit attitudes toward computers. Significant differences between Frequent and Infrequent Library Users emerged for six of the items (see Table 10). Frequent Library Users held stronger positive attitudes than Infrequent Library Users for four items that focused on the ability of the respondents to be more productive in their work. To the extent that library use reinforces such attitudes, it is likely that library use and computer use are increasingly becoming preconditions for faculty productivity.

Table 10. Frequency of Library Use and Attitudes Toward Computers

Statement	Agreement of ILUs*	Agreement of FLUs
Computers can help me improve the quality of work	1.94	1.56***
Computers make it easier to work collaboratively	2.07	1.81**
Computers make it possible to do more work in less time	2.15	1.70***
I'm not interested in learning more about computers	4.22	4.52**

* Scale: 1 = strongly agree, 2 = agree, 3 = no opinion, 4 = disagree, and 5 = strongly disagree.

** Probability less than .05.

*** Probability less than .01.

6.0 Implications of the Findings

Naturally, the findings of this study cannot establish that there is a causal connection between computer use and library use. They do, however, provide substantial evidence that levels and frequency of computer use are positively related to library use. They further suggest that those faculty who are regular library users are the same faculty who are using common computer applications. These include such applications as email, bibliographic databases, statistical packages, bulletin board systems, data collection, file downloading, and wordprocessing. Conversely, it appears that faculty who do not use the library regularly are, for the most part, not using computers.

6.1 The Scope and Nature of Electronic Services

The findings of this study have several important implications for university library services. The first relates to the scope and nature of the electronic services provided by libraries. At the time this study was conducted, the electronic resources made available by the WMU Libraries, like those in many other university libraries, necessitated the possession of basic computer skills (e.g., use of the keyboard, function keys, a mouse, and pulldown menus). In addition, these databases functioned using a variety of interfaces requiring very different search procedures and commands. These interfaces often required users to invoke help commands to obtain the information needed to perform all but the basic functions. As a result, library patrons and in some cases even the library staff were challenged by the need to master intricacies such as truncation, printing, downloading information, or field searching in more than one system.

This study indicates that a distinct "computer" bias does seem to exist among frequent faculty users of the libraries, one which focuses on experience and skill in the use of a variety of computer applications. Could it be that libraries with their expanding electronic services, which often contain inconsistent interfaces and procedures, are not sufficiently user-friendly for faculty who tend not to use computers? Smalley states that "our market-driven economy has motivated myriad vendors to develop a profusion of electronic products and services . . . . As customers in this market, we are creating a software-dependent world with few, if any, uniformly adopted conventions . . . and are thus eliminating much of the familiar ground that users once relied on in moving among libraries and library systems." [11] It seems possible that the rapidly growing number of electronic databases, coupled with the variety of electronic interfaces, may discourage use of the library among the segment of the faculty who are not frequent users of computers.

If this concern is valid, what are some of the ways libraries might address this issue? Certainly, there is a great need for standardization among electronic interfaces in libraries. To address this need at WMU, a plan was recently implemented to minimize the number of different electronic interfaces that are necessary to use the Libraries' resources. This has been accomplished in part by migrating a number of database subscriptions to CD-ROM versions from a number of vendors to OCLC's FirstSearch service.

Another strategy used by libraries to standardize services, and perhaps reduce user frustration, is to provide an OPAC which uses a graphical user interface (GUI). Users who participated in a study at the Parke-Davis Pharmaceutical Research Library found a GUI-based OPAC easier to use, felt that it required less training, were able to get results from it more easily, and were inclined to use the GUI system more often than a text-based system. [12]

Other libraries are providing access to a group of bibliographic databases through recent innovations such as the Ovid Client graphical user interface software, which complies with the Z39.50 protocol. As these GUI-based client/server systems improve and proliferate, allowing greater access to a variety of databases,

and allowing additional services, it is possible that the difficulty associated with using these resources will be lessened. In turn, these systems may attract faculty who previously avoided using electronic library services.

With the expansion of the Internet and the World Wide Web, there are even greater opportunities for libraries to become more user-friendly. The Web was designed to enable users to access different forms of media on computer networks in a consistent way, and addresses a variety of software and hardware standardization problems by offering access across different computer platforms. On many campuses the Web is already available at a variety of access points, including the library, and many of the computer labs, offices, and residence halls. Those who have access at home or through their offices can also use Web resources when needed, thereby accommodating their busy schedules.

Currently, users in the WMU Libraries are being encouraged to access a variety of materials which were formerly only available on CD-ROM, through the Web, including selected government documents. In addition, library aids, such as a descriptive guide to over 70 bibliographic databases, have been mounted on the Libraries' Web page as an alternative to printed versions. This page is also being used as a gateway to the OPAC and many of the Libraries' databases that are available through remote access. The Libraries are also currently testing a product called WebPac as a means of providing a uniform search interface to many of these databases via the Web.

This reflects a growing trend among libraries to use products that provide a uniform interface through the use of the Web. Dowlin states that libraries "need to adapt their methodologies to take advantage of the new tools" and the "library that successfully adapts its systems for . . . distribution of information and knowledge to the new technology will become a much more central institution in the community served." [13]

6.2 User Assistance and Education

A second issue that needs to be considered in tandem with the issue of electronic resources and interfaces, is reference service and user education. The growth in computerized information has created a surge of rising customer expectations relating to electronic resources, resulting in a demand for improved services. [14] Most reference librarians would agree that this means reference desks are busier than ever and the demand for group instruction is growing rapidly. Librarians are currently expected to assist and instruct users in most of the traditional types of print resources along with a myriad of online databases in their different formats, in addition to the almost limitless information potential of the Internet. This is on top of trouble-shooting a host of technical problems, such as printer jams and "frozen" systems.

Acting as consultants to patrons who are surfing the World Wide Web, for example, is an interesting challenge for many librarians. Adding this activity to an already full instructional load without the addition of staff, however, is an

unreasonable expectation. In the words of one author, it "is not necessarily the ride for which all academic librarians originally bargained." [15] In fact, as the "information infrastructure becomes more complex, it is more likely that the user services staff will not be highly skilled in a variety of specialties. Rather, they will have a basic general skill level with deep specialties in only a few areas." [16] It is no longer possible for any individual librarian to keep abreast of all of the new developments in the electronic information arena.

As a result of these pressures on staff, is it possible that faculty who tend not to use computers may not be able to obtain the kind of professional library help they need in order to master computerized information services? If so, this alone could easily discourage library use among this segment of the faculty. An additional factor which may also affect non-users of these services is the fear on the novice user's part that he or she should already know more about computers and computerized services, resulting in a general reluctance to approach busy librarians for assistance. Yet another factor that may affect user satisfaction is the confusion associated with where to go for computer-related help on today's campuses. For example, should faculty who are using library services through remote access contact the library or the computer center with questions regarding accessing and searching networked information?

What are some of the ways in which these issues regarding user assistance and education might be addressed? A number of libraries are experimenting with creative methods of enhancing and redirecting reference and user education in their institutions. Frequently these efforts involve utilizing a team approach and collaborating with computing professionals on campus to create new models of assistance.

6.3 Collaboration with the Computer Center

There are several compelling reasons why libraries are entering into partnerships with computer centers in providing service to users. Traditionally, librarians have been concerned with managing all aspects of information, and the computing staff have been concerned with the machinery, "emphasizing technology with information provision as a by-product." [17] As the library changes and the provision of information becomes increasingly more dependent on the "machinery," the lines are becoming less distinct between the services of the library and those of the computer center.

Because it has become impossible to master all one needs to know in order to instruct users in accessing and navigating networks and managing digital information, teamwork becomes necessary. Kiesler suggests that it is important for staff to share their individual expertise in areas of technology with each other in order to stay current and "to diagnose problems and come up with solutions." [18] Findings by Schiller indicate additional factors that support the need for cooperation between the library and computer center, such as a common lack of staff and funding. [19] Another pressure that libraries and computer centers jointly face is user demand for more recent and cutting edge technologies. [20]

All of these factors have led to an environment in which "the warring stances of the past are disappearing and being replaced with recognition and mutual respect of two expert components interacting to provide information services." [21] Collaborative activities which draw on each others' strengths can serve to address some of these mutual problems and help stretch university budgets.

The results of this study suggest another possible reason for collaboration between the library and the computer center. Because more experienced library users appear to be more experienced computer users and vice versa, it is logical to ask whether or not non-users of libraries can be brought along by encouraging use of computers. In short, do instructional efforts in either realm lead to greater success in the other?

Certainly there are points in the process of conducting research in which the use of computer applications, in-house library resources, and networked resources are so interwoven that it is difficult to separate them. What was envisioned years ago as the Scholar's Workstation has become a reality in many institutions--with the capability of performing such functions as "computation, word processing, information retrieval, data analysis, computer graphics, network communications, and library access," all from a single terminal. [22] Writing and electronic publishing may indeed be at the heart of where computers and libraries come together. Faculty can now retrieve and capture information in many media formats and incorporate it into new documents. Through the use of the Web, they can also create documents that are dynamic, with multiple links to additional resources.

Further research needs to be done to determine if instruction in computing can indeed affect library use and vice versa, but the results from this study clearly support the idea of collaboration between the academic library and the computer center. As an added bonus, it may be possible for the computer center and the library to jointly target certain beginning and advanced users when planning activities, since these populations appear to be shared by libraries and computer centers.

As a collaborative activity that serves faculty, the Libraries and University Computing Services at WMU have undertaken various training efforts. In 1995, a number of workshops were conducted in which librarians and computer staff worked together to raise the awareness level of University administrators and faculty regarding new bibliographic databases, and resources available through the World Wide Web. Additional seminars devoted to specific disciplines have also been conducted for departments, in which faculty are given more in-depth training in electronic resources.

As a result of a recent proposal jointly submitted to the University administration by the Libraries and University Computing Services, funding was obtained to conduct a week-long instructional technology series for faculty. The goals of this program were to enable participating faculty to comfortably use

Internet information resources and to apply information and presentation technologies to enhance their students' learning experiences. Other collaborative activities have included joint efforts among librarians, computing staff, and faculty to develop and evaluate multimedia modules that instruct students in how to conduct research. In all of these instances, it has been beneficial to be able to choose from the software and hardware that are available in either the computer center or the library, in order to stretch campus resources. These include high-level graphic and sound editing software, authoring tools, print and slide scanning equipment, digital cameras, and color laser printers.

Libraries are also teaming with campus computing services at other universities to instruct users in the latest technologies. One of the most notable projects has taken place at Rice University, which re-engineered its library organization by creating a merged user services department consisting of staff from both the library and computing areas. [23] This radical approach was seen as a means of achieving true collaboration between these units in an attempt to effectively target user needs.

Additional creative methods of assisting users have been proposed. Creth, for example, calls attention to the idea of a remote user access service via a "teledesk" which would allow visual and vocal interaction between the user and an information services consultant, based on the service employed at Disney World. [24] Library Web pages are yet another opportunity to direct users to relevant information resources; they can also include library tutorials, which are starting to appear regularly on the Web, both for general use and for use in specific courses. These library pages are often created through a collaboration among librarians, faculty, and computing staff.

6.4 Marketing Electronic Services and Communicating with Faculty

A third issue related to users and non-users of computers and libraries is the marketing of library services to faculty. Adams and Bonk indicated that the most common reason for not using electronic information resources at the libraries of the State University of New York is a lack of awareness of what is available. [25] For example, when the participants were questioned about the types of resources they would like to use, a common response was that they didn't know how to answer because they didn't know what was available and would like more information. Faculty also indicated that there was an ongoing need for information about available databases and resources, to be disseminated through a variety of means and media (e.g., small group sessions, printed documentation, telephone assistance, and email).

With the development of the Internet and the World Wide Web, the issue of faculty awareness becomes even more important. The information available through these resources is increasing and changing at such an accelerated rate that faculty are likely to have great difficulty finding and sorting relevant materials. At the time the survey of WMU faculty was conducted, these tools were not widely available on campus. Therefore, questions

relating to them were not included. These resources have since become available, however, and their use on campus is expanding daily.

In order to address this lack of awareness of resources, closer attention may need to be paid to how we communicate with faculty. Most librarians will acknowledge that traditional forms of marketing library services and communiques such as mass flyers and other printed material are not all that effective in reaching faculty. Many libraries have also found it difficult to entice faculty to attend general informational sessions on electronic services. As the pressures of teaching, research, and service escalate, faculty have less time to devote to keeping abreast of what they need to know on a daily basis. New methods are needed to get the message across in the information-overloaded campus environment. Drake maintains that, as a result of the effect of technology in libraries, a new customer-driven approach is needed in marketing services, to move beyond the traditional approach which has focused on collections. [26]

In order to address this challenge at WMU, a customized approach is being taken to inform faculty of the electronic services that are available. This strategy centers on the use of the already established liaison program between the library and academic departments on campus. Activities that have taken place as a part of this program include: (1) demonstrations of electronic resources and the Internet by librarians at departmental faculty meetings, (2) email communications with departments regarding the acquisition of subject-specific resources in their respective fields of interest, (3) one-on-one work with faculty to develop Web-based library pages for individual classes, and (4) lunch invitations from library staff to new faculty to share relevant information.

Because the librarians work with faculty in a personal way, some of the insecurities that faculty have about new library services have been eliminated, and new insights have been gained into barriers that may prohibit effective library use. For example, it came to light that some faculty were frustrated that they could not use wordprocessing in the library or connect to databases using personal laptop computers when conducting research. Other faculty expressed an interest in having librarians establish office hours in the academic department itself in order to facilitate communication and offer assistance with using electronic resources. These are all issues that have provided guidance in the planning of future services for the WMU Libraries.

Some faculty members have also expressed the belief that faculty delegate library work to research assistants, viewing the work as essentially clerical in nature. This is an interesting viewpoint that could use further exploration. For example, do research assistants sometimes have difficulties when conducting library work for faculty? For one, the assistants may have trouble making judgment calls about the value of the materials they are finding because they do not have the breadth of experience and subject knowledge that the faculty have. In addition, if the assistants do not find materials as expected, they may have difficulty changing their strategy and looking for materials in

marginally related subject areas (i.e., conducting a thorough search). Additional research needs to be done to determine whether faculty who delegate library activity may be missing important information relevant to their needs.

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Other libraries are taking their cue from the business world in marketing electronic services. This may serve to draw in faculty who are currently non-users of the library. Reference librarians and computing consultants at Rice University, for example, planned and implemented a technology showcase in the library. As part of this event, computer and software vendors demonstrated their products along with User Services staff who were showing numerous electronic information products, the Rice University campus-wide information system, and curriculum development projects. [27]

7.0 Conclusion

Central to the discussion of the relationship between library use and computer use have been strategies for reaching the non-users or infrequent users of computer services and libraries. The question can be posed--is it worth the time and effort to bring these faculty into the fold when we are already quite busy trying to serve those clients who do frequent the library and who use computers on a regular basis?

In answering this question, it may be instructive to consider several factors. The results of this study indicate a clear correlation between rank and use of library services, especially those that are electronic in nature. It is interesting to note that this may relate to expectations of publishing. At WMU, it is clearly stated that a faculty member whose major achievement is outstanding competence as a teacher may be promoted to assistant or associate professor, but for promotion to full professor, a faculty member must have achieved either substantial or outstanding professional recognition (i.e., through publications). Such expectations are, of course, common at many universities. It is difficult to argue that all faculty need to use computers and the library in order to achieve tenure and promotion, or carry out their teaching responsibilities. Nonetheless, strong arguments can be made for the benefits of using these resources.

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Electronic publishing of monographs, journal articles, reports, and other data is certainly on the rise. If faculty members wish to be able to access the entire scope of literature in their fields, they will need to use computers and networks. Electronic publishing also affords faculty the opportunity to keep abreast of the latest research and developments in their areas because of the availability of wide access and a quick distribution timetable. In order to efficiently retrieve these materials, it is also necessary to be able to search for and manipulate electronic documents--skills that are often learned through contact with librarians. Besides retrieval of electronic publications, faculty also need to know how to submit manuscripts electronically and create documents on their own servers, or they may be left behind as publishing continues to head in this

direction.

The Internet has also supported tremendous strides in collaboration among users. Faculty who rely only on traditional forms of communication are missing out on a tremendous opportunity to consult with other colleagues, regardless of institutional and geographic boundaries. These contacts may be made through channels such as email, discussions lists, electronic bulletin boards, and links in Web documents.

As the prevalence of computerized resources increases, will faculty who do not use computers or electronic resources be at a disadvantage professionally? It seems likely. A growing number of universities are placing greater emphasis on information technology in order to retain a competitive edge in higher education. In some cases, material rewards in the form of travel funds, equipment allocations, or merit stipends, are given to faculty who are using these technologies for creative purposes. Faculty who are not using these technologies may also command less respect in the years to come from their colleagues who are using these resources. Librarians can help faculty in this area by assisting them in searching for appropriate applications of instructional technology.

Students need to learn how to use these electronic resources in almost every field. Will students be at a disadvantage if faculty are not using or requiring the use of this technology in their classes? Future research needs to be done to determine if there is a correlation between the use of technology by faculty and the use by students. Still, it is safe to say that faculty encouragement of student use of technology such as the World Wide Web gives students exposure to some of the latest instructional delivery systems available and reinforces computer skills that students will need when they enter the work force.

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Finally, if the library ignores an entire segment of faculty who are infrequent or non-users of its services, this may send the message that the library feels these faculty are not important and that the library doesn't care about them. In this era of dwindling funds and growing competition for campus resources, it may be unwise for libraries to disregard any of its constituents. Instead, we should delve deeper into the cause of this disuse. A healthy percentage of use by greater numbers of faculty may be very helpful in justifying the budget dollars needed to keep the library vital and successful in the years to come.

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