

ABSTRACT

This study consists of a literature review and a subsequent survey of librarians in small academic libraries concerning their perceptions of the impact of the interactive computer technologies upon themselves and the organization of their libraries.

A survey instrument was designed and sent out to seventy-six small academic libraries in thirteen states of the mountain plains region. An eighty-three percent return rate was received. The survey instrument presented a broad spectrum of questions which centered around five areas: 1) planning/policy; 2) job descriptions/rewards; 3) reeducation/retraining; 4) emotive; and 5) patrons.

The survey was intended to reveal areas of concern for librarians as they deal with the new interactive computer technologies in small academic libraries in academic institutions with less than 6,000 head-count enrollment. The results show that the perceived impact of automation on these libraries varied. However, the

results indicate that when it comes to the interactive computer technology in their libraries, the most common cause for concern for small academic librarians is in the areas of reeducation/retraining and patrons.

A SURVEY OF THE PERCEPTIONS OF LIBRARIANS REGARDING
THE IMPACT OF INTERACTIVE COMPUTER TECHNOLOGY
IN SMALL ACADEMIC LIBRARIES

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PREFACE

The origin of this research effort was generated by a seminar given by Maureen Pastine and Betsy Baker at Emporia State University, the summer of 1989, on the Dynamics of Small/Medium Sized Academic Libraries. A number of small academic library librarians attended this seminar in which it became apparent that automation in the guise of the interactive computer systems is one of, if not, the hottest issue in these small academic libraries today.

There was evinced through the course of this seminar a real concern by the librarians in how to deal with the multifarious ramifications of the technologies on their library organizations and on themselves. Everyone seemed to have differing answers to the same kinds of problems, but what became apparent was the paucity of hard facts dealing with the issue of the impact of the interactive technologies, particularly in relation to the small academic libraries. Baker and Pastine pointed out how little research has been done

that addresses this issue, which immediately propelled this novice into the unexpectedly huge project of which this thesis is a result.

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CHAPTER ONE: INTRODUCTION

PURPOSE OF THE STUDY

This treatise is a study of the perceptions of librarians concerning the impact of the new interactive computer technologies on themselves, and by extension, on the organizations of small academic libraries. Organization, structure and work design systems are significantly different in small academic libraries than in libraries of larger institutions. The impact of the new interactive computer technologies based on the factor of the size of the library is studied here because there is little evidence of hard research previously done on this basis.

The assumption, as stated, is that small academic libraries are intrinsically different than larger academic libraries. However, at least initially, it must be accepted that small academic libraries may be experiencing the same kinds of benefits and the same kinds of problems as the larger academic libraries in the new

interactive computer environment. This initial comparison with larger academic libraries is made due to the lack of research done exclusively on small academic libraries.

Just a survey of the extent of automation alone will not establish a true sense of the impact the new interactive computer technologies may be having on small academic libraries. Therefore, a survey instrument was designed to reflect the major areas of concern in the literature and in the available research efforts which have preceded this study. There was an attempt to limit the literature review to those articles and studies which considered small academic libraries, but considering the paucity of material found on this topic many sources from across the spectrum have been included as well.

First, two ideas were examined: one, that the new interactive technologies are causing changes in organizational structures and two, that the situational variance of size is worth studying. Then, since the literature describes a multiplicity of related concerns, the examination of the literature proceeds by grouping the variables under a broader spectrum of five categories for purposes of easier examination and com-

parison. Therefore the following general review of the literature was conducted loosely grouped around the five categories of: 1) planning/participation, 2) job descriptions/rewards, 3) reeducation/retraining, 4) emotive, and 5) patrons. After the review four related research studies were examined as models for the design of the survey instrument in this research effort.

NEW TECHNOLOGY AS A FACTOR CHANGE

Interactive computer technologies are a fact of life for libraries in the information age now upon us. There appears to be little argument that the new interactive computer based technologies are invading libraries of every kind. After twenty years this invasion has made an impact on nearly all libraries and librarians whether they have embraced the new interactive computer technologies or not. This tangible wave of new interactive computer technology sweeping through libraries is sustained by three basic beliefs about the technologies as articulated by Carolyn Gray in 1973:

1. that the application of technology in libraries will result in benefits to staff and users;

2. that technology is the inevitable wave of the future; and
3. that as librarians, if we do not embrace technology, we will be left to fade into oblivion in our museums full of books.¹

Over the course of time, the exigencies of the library's place in society is proving the actuality of assumptions two and three. Certainly academic libraries are urged at every turning to embrace the new interactive computer technologies. The advice of Charles Ritcheson, Director of the University of Southern California libraries, is that interactive computer technologies are "something all colleges, whether two year colleges or graduate institutions, should adapt to and the sooner the better for the sake of future survival."² Most libraries appear to be taking this advice to heart, however the level of benefits and the degree of change caused by the new interactive technologies is still a matter of some contention.

The future survival of libraries is founded on the beneficial expectations of the new interactive computer technologies. Ann de Klerk and Joanne Euster agree that, "the rapid introduction of new technologies into

libraries has been widely expected to lead to sweeping changes in the ways that libraries are organized and managed."³ However, the expectations and the reality of the organizational changes created by the interactive computer technologies may be dramatically different. It is possible that the reality may be disappointing. Baker and Sandore report that the "discrepancies between what we believe to be a high level of service and productivity and what well-executed statistical analysis" have suggested, indicates that the interactive technologies may be less effective in their impact than what has been previously surmised in the literature.⁴

David Lewis, for one, does not deny that technology is a factor of change, but he does question how well libraries may be adapting to that change.⁵ De Klerk and Euster, in an informal survey concerning the impact of technology, found that library directors were without any consensus regarding "the extent, scope, or the future of change."⁶ Apparently, even library directors are confused on the issue of and the extent of technology as an agent of change in their own organizations.

Nevertheless it is generally accepted in the literature that the pressures of the new interactive computer technologies are dictating the rate of and the type of changes taking place in libraries today. Technology as a dominant agent of change in libraries is often cited as germinal to organizational changes, staff efficiency and increasing service demands. It is argued that just the very addition of new technological systems to a library will disrupt the old work systems and organizational structures. People such as Betsy Baker, Beth Sandore, Leigh Estabrook and W. R. Converse believe that during the last twenty years librarians and library organizations have undergone profound changes, mostly as a result of interactive computer technology.⁷

Perhaps part of the confusion as to the extent of the change taking place in libraries as a result of the new interactive computer technologies may lay in the fact that change is taking place internally without outward visible signs of it. It is noted by Margaret Myers that libraries exhibit a general reluctance to make significant changes to administrative structures in the face of interactive technologies. At the same time however, she points out the influx of new posi-

tions, eliminated positions, upgrades, and downgrades, all resulting from computerized automation.⁸ It is well established, as Stephen Robbins points out, that traditional bureaucratic organizations, which libraries tend to be, are highly resistant to change.⁹ It may be possible that these kind of bureaucratic organizations are not updating their visible organizational charts to reflect the actual changes taking place in their organizations as a result of the new interactive computer technologies.

It is evident that the new interactive computer technologies are creating changes, if not evident or actual changes at least changes in how librarians perceive the progress of their profession. The confusion evinced in the literature as to the extent of the changes being wrought by the new interactive computer technologies substantiates the need for not just this prototype research effort but further systematic research efforts addressing this issue.

SIZE AS A UNIQUE IDENTIFIER

Maureen Pastine, Director of Southern Methodist University Libraries, and Betsy Baker, Head of Reference Services at Northwestern University, voice

the concern that small academic libraries may be acquiring the new interactive computer systems based on specious reasoning like, "Look what they're doing. We have to do it too!"¹⁰ Baker and Pastine infer that the small academic libraries are simply following the lead of the larger academic libraries in terms of automating services and functions. Just because larger libraries are automating, and because automated systems are becoming economically feasible for the small institutions, is this enough justification to automate? Are library administrators in small academic libraries really asking questions like, "Why do we need this particular kind of system?" Or, "How are we going to train our librarians in this new technology?" Or, "What will be the implications of the new multiple role requirements for our librarians?" Or, are librarians in small academic libraries properly addressing themselves to the changing roles technology is forcing upon them?

Every library, like every individual, exhibits characteristics peculiar to that entity. Why then should small academic libraries wish to emulate the technological systems and organizations of the larger academic libraries? The situational variance of the

environment of a small library may not only invalidate the usefulness of a large technological system imposed upon it, but once imposed such a system may actually hinder the library's operations. Gerard McCabe contends that "the small academic library is not a microcosm of the larger institution; it is an entity in its own right."¹¹

Since there is little research found on this idea of situational variance by size there is the challenging supposition, made by Baker, Pastine and McCabe, that the new interactive computer technologies have naturally permeated downwards from the large relatively money rich academic institutions into the small institutions.¹² On the other hand, it may be possible that the small academic library is adapting to the new interactive computer technologies much faster and easier than their larger counterparts because of their size. Lewis explains that the "smaller institutions, such as college libraries, unlike their larger cousins, are likely to be configured as simple structures. This allows well-administered college libraries to create programs with a focus and coherence impossible in most university libraries."¹³ If small academic librarians take the risk and are willing to make the automation

decisions and plans themselves to fit it to their situations, such a force as the new interactive computer technologies could conceivably have less impact in small academic libraries.

Smallness tends toward an informality of management and the flatter organizational paradigm espoused by theorists like Tom Peters and Charles Martell.¹⁴ Logically, a flatter, simpler, organization is better suited to adapting to changes like those represented by the new interactive computer technologies. Thomas Shaughnessy agrees that the "newly automating small library is perhaps more suited" to absorbing the impact of the new interactive computer technologies than are larger library organizations.¹⁵

If the factor of size creates library organizations with simplified structures and procedures as opposed to the immense complex bureaucratic organizations generally found in large academic research libraries then size must be given consideration as a unique control variable in the study of the impact of the new interactive computer technologies. This is exactly what is proposed for this research effort--to study the impact of the new interactive computer technologies based on the unique identifier of size. In

this case it will be academic libraries which are part of institutions which have a head count of less than 6,000 students attending.¹⁶

NOTES

1 Gray, Carolyn M., "Technology and the Academic Library Staff or the Resurgence of the Luddites," in Professional Competencies - Technology and the Librarian, ed. Linda C. Smith (Champaign, IL: University of Illinois, 1983), p. 69.

2 Charles Ritcheson, "The Library of the Future-- Now," Electronic Learning, 7, No. 6 (March 1988), p. 22.

3 De Klerk, Ann and Joanne R. Euster, "Technology and Organizational Metamorphoses," Library Trends, 37, No. 4 (Spring 1989), p. 457.

4 Betsy Baker and Beth Sandore, "Motivation in Turbulent Times," Paper, Northwestern University, Evanston, Illinois, 1990, p. 7.

5 Lewis, David W., "An Organizational Paradigm for Effective Academic Libraries," College & Research Libraries, 47, No. 4 (July 1986), p. 343 & 345.

6 De Klerk and Euster, p. 458.

7 See, "Productivity, Profit, and Libraries," by Leigh Estabrook, Library Journal, 106 (July 1981), "Research," by W. R. Converse, Canadian Library Journal, 41, No. 5 (October 1984), and Baker and Sandore paper.

8 Margaret Myers, rev. of Human Aspects of Library Automation, ed. Debora Shaw, Information Technology and Libraries, (September 1987), p. 233.

9 Stephen P. Robbins, Organization Theory, (Englewood Cliffs, NJ: Prentice Hall, 1987), p. 227.

10 Baker, Betsy and Maureen Pastine, "The Dynamics of Small to Medium Sized Libraries," LI 855, School of

Library and Information Management Seminar, Emporia State University, 9-11 June 1989.

11 McCabe, Gerard B. ed., Operations Handbook for the Small Academic Library, (NY: Greenwood Press, 1989), p. xiii.

12 McCabe, p. xiii, Baker and Pastine.

13 Lewis, p. 344.

14 See, The Client Centered Academic Library, by Charles Martell, Jr. (Westport, CN: Greenwood Press, 1983), and Thriving on Chaos, by Tom Peters, (NY: Harper & Row, 1987).

15 Albritton, Rosie L. and Thomas W. Shaughnessy, Developing Leadership Skills, (Englewood, CO: Libraries Unlimited, 1990), p. 58.

16 College Blue Book. 1989 edition.

CHAPTER TWO: LITERATURE REVIEW

PLANNING/PARTICIPATION

The first category, as outlined in the research problem, was reviewed under the combination grouping of planning/participation. This category is labelled planning/participation because planning is integral to the mission of any library and would presumably be affected and even altered by the revolutionary changes that the new interactive computer technologies are purportedly having on library organizations. Participation is used here as a one-word correlative description of the decision levels that are involved in planning for, acquiring, and implementing the new interactive computers into the organizational structure. Both planning and the level of participation in decision making are fundamental indicators of the configuration of an organization's structure, whether it be a traditional or flat organization. Measurement of this category will help uncover the degree of impact technology

is having at the structural level of the library organization.

The concern for planning in the literature centers around the idea of whether, as alluded to in the introduction, the decision makers in libraries are thinking through and carefully delineating the procedures necessary for successfully integrating the new technologies into the organization and the subsequent optimal operations of those new technologies. People like Robbins, Baker, and Martell question if librarians are articulating satisfactorily their automation policies in terms of the acquisition, the implementation, the maintenance, the roles of the librarians, and in general, the placement of automation within the parameters of the mission of the library.

Good solid planning is the essential precondition for successful utilization of the new technologies in libraries. John Olsgaard says it must "be considered self-evident that technological innovation within an organization should be well planned and executed."¹ Olsgaard goes on to warn librarians however, that "adequate planning remains perhaps the single greatest organizational deficiency" in libraries when new interactive computer technology is introduced.² If a per-

ceived change in organizations can be measured in relation to the embracement of technologies it could prove that the new interactive computer technologies are having a tremendous impact on libraries and librarians.

One indicative element of proper automation planning that is receiving increasing attention in the literature is the idea of ergonomics. Ergonomics concerns the planning and placement of technology in a controlled environment designed for employee comfort, the idea being to thereby increase production. Including ergonomics in the automation process is supported by studies which indicate that the adjustment of the physical environment to the satisfaction of the workers will result in a non-threatening and comfortable environment which will improve production. Marvin J. Dainoff agrees with the importance of concentrating on ergonomics in association with the adaptation of technology. Staff comfort in using the technologies will reduce physical problems and probably produce a better end product.³ The inclusion of ergonomics in the planning process may be an indicator of organizational change caused by automation in libraries.

Another much discussed idea in the literature is that of partnership in management. Many writers support the suggestion that library organizations not only should, but must, take on the aspects of a partnership in management or a participatory management organization as a necessary adjustment to the changes new technologies are creating in libraries. This is an idea espoused by noted organizational theorists like Charles Martell and Tom Peters.⁴ However, previous discussion in this paper as to the unique control variable of size suggests that small academic libraries may already be organized in participatory management format. Reynolds endorses this suggestion when he writes about the new technologies being adopted by libraries: "With small-scale systems or small libraries, the situation is somewhat different and often less formal. Even in these instances, however, involvement of staff who will be affected at all levels by a new system or service is a requisite to successful implementation."⁶ Thus, the recognizable degree to which a library has conformed to participatory management practices may be another indicator of the impact of the new interactive computer technologies.

Another alteration in library structure caused by the new technologies may be found in a shifting of staff or a blurring of departmental boundaries. If job descriptions expand, responsibilities increase and routine technical tasks are turned over to support staff. Some shifting of staff across previously rigid departmental boundaries seems almost inevitable, particularly in those departments that are more susceptible to complete automation systems. De Klerk and Euster found in their study that the possible blurring of departmental lines caused by increased automation would bring about greater staff and interdepartmental cooperation.⁶

It does not follow, however, that the quantity of staff positions will be affected. Some fear has been evinced by librarians that automation may decrease job positions. Instead, as Leslie Kong and R.A.H. Goodfellow assert, "entire jobs will not disappear when automation is introduced; rather the nature of jobs will change."⁷ In fact, one suspicion surfacing in the De Klerk and Euster study was the thought that automation may result in more positions being introduced into the library.⁸ Therefore, it is possible that internal cooperation and staff size may be indicators of organi-

zational change because of the new interactive computer technologies.

JOB DESCRIPTIONS/REWARDS

If the structure of library organizations are being transformed by technology there is a clear need to closely examine the next category of job descriptions/rewards. A look at job descriptions and the attendant rewards of possible expanded job descriptions may reveal more readily the visible signs of change caused by the new technologies than will any cursory examination of organizational charts.

There is a general acceptance of the idea that technology will enlarge job-descriptions for professional librarians and support staff. Frances Benham says the new interactive computer technologies will offer "efficiency and effectiveness coupled with new opportunities and responsibilities for librarians."⁹ Enlarged job descriptions will reflect increased diversity, skill variety, more meaningful task identity, job enrichment, vertical expansion, greater control over work, participation in planning and evaluation, increased freedom, increased independence, and increased responsibilities. The degree and the direc-

tion these new job descriptions might take will determine the degree of impact the new interactive computer technologies are having on libraries.

Measurement of expanded or flexible job descriptions is essential for a study on the impact of the new technologies because, as Donald Frank explains, "if professional librarians and classified staff are perceived as position-flexible within the particular library, discussions and eventual decisions on automation allocation will occur in an administrative climate that is more conducive to organizational change."¹⁰ It follows that where staff are not "position-flexible" in an organization then change may be minimal despite the imposition of major new technological systems.

One persistent warning in the literature is that the problem of duality for librarians may continue to exist in a technological environment. Duality is that blending of activities to the point that professional and paraprofessional job-descriptions are in practice indistinguishable. Roger Greer posits that, "librarians have not changed their role in society to keep pace with social and technological changes. . . . Library users cannot distinguish the difference between librarians and other staff members and thus, cannot

appreciate the expertise of librarians. As a result the benefits of professional status are not granted by the public."¹¹

Roberts and Konn tell us that technology may actually contribute to the problem of duality; ". . . a blurring of professional/non-professional boundaries and responsibilities associated with technological advances makes it less easy to justify many cherished staff conventions."¹² The cherished staff conventions are that professionals are the only ones capable of acquiring technical skills and knowledge. Other theorists seem to be going beyond this limited thinking by stating that the embracement of technology will provide the professional with the opportunity to go beyond just simple machine tasks.

Robbins points out, "routineness is the common denominator . . . of technology."¹³ The supposition is that technology will subordinate a significant portion of the mechanical functions professionals are now involved in and free them for the professional activities they are trained to do. The result, Estabrook says, will be found in production increases as more expensive professionals are shifted to other areas of endeavor and routine tasks are taken over by

less skilled workers.¹⁴ Routine technical work will become the job of the paraprofessional while the librarian's prerogative will be in analyzing the needs of the users, designing the access systems and instructing users and support staff in the uses thereof.

Other writers like Kong and Goodfellow support the supposition that the new interactive computer technology may be the change factor needed to split the duality of job-descriptions in two, and once and for all validate the professionalism of the librarian.¹⁵ It is technology which will make work redesign not only possible and economically feasible, but imperative for the assured future existence of the librarian as a professional.

New interactive technologies such as on-line reference services "will allow librarians to realize the inherent value of their intermediary roles."¹⁶ Intermediary roles will necessitate more contact with patrons as they teach users to become self-sufficient end-users. The danger is that without being indoctrinated with a clear understanding of the options opened up by the applications of the interactive computer technologies, the commitment to the patron may suffer

as the professional retreats into the secure realm of technical processes.

Closely upon the heels of expanded job descriptions follows the logic that new responsibilities, new positions and new skills attained by librarians should result in greater rewards for librarians in both prestige and pay. Horny agrees, "abilities in information management fields may well acquire added prestige as well as genuine power."¹⁷ She continues with the hopeful assertion that the rewards will not just accumulate in added prestige, but that the altered job descriptions will make librarianship "both more interesting and more lucrative."¹⁸ Therefore, measurement of both expanded job descriptions and any subsequent rewards may be indicators of significant organizational change due to the new interactive computer technologies in libraries.

REEDUCATION/RETRAINING

To support expanded or altered job descriptions and organizational changes adequate training will be required of librarians. Continuing education is a subject receiving a great deal of attention in the literature in conjunction with automation. Training receives

this attention because, as Anne Lipow writes, "staff is the most important resource in any library."¹⁹ Tom Peters flatly states that in any organization, "the work force is indisputably our principal asset."²⁰

The issue of continuing education revolves around the apprehension that there is an evident ready provision or adequate funding in libraries for the initial costs of the technology, but a lack of equal time and cost spent in supporting the reeducation and retraining of personnel expected to operate the machines at optimum capacity. Benham believes that the capacity of the machines to produce quality time saving efforts will only be as good as the quality of effort put into reeducating and retraining the staff to operate those machines.²¹ The fear is that although most libraries apparently endorse some form of continuing education for employees, training is often negligible at best, and at worst misleadingly detrimental to the operations of the library.

Dennis Reynolds and Charles Martell agree that reeducation and retraining efforts may be perilously compromised by many libraries in the rush to automate.²² James Rettig urges librarians to more effort in this area as well, "training inevitably involves a

certain expense and a library's administration must commit itself to supporting training at the same time it commits itself to providing the service."²³ The time and money put into acquiring a system should only be exceeded by the time and money put into reeducating the employees to not only operate the new systems, but to gain an understanding of how the systems fit into the operations of the library now and into the future.

The problem with current continuing education efforts is that initial training received in library schools, workshops or vendor training cannot be considered adequate for any length of time; technology itself is changing too fast. Karen Horny informs us that there are computer experts who believe computer hardware and software becomes "outdated within five years . . . It may be more difficult to realize that, like equipment and programs, procedures that were once state of the art and that suited prior circumstances extremely well may no longer be so adequate."²⁴ Anne Lipow endorses this five year rule. She says that training given to "staff during the first year of any five-year period would be obsolete by the end of five years."²⁵

Another problem with current training efforts is found in the content and quality of the training. Carolyn Gray believes that continuing education efforts may be commendable, but those efforts "do not provide an adequate solution to the technological obsolescence of most library training."²⁶ Delmus Williams agrees that current automation training efforts now in libraries do not adequately address the extraneous skill levels requisite of proper computer operation.²⁷ Shaughnessy suggests that the skills required of the new interactive computer technologies make it imperative for librarians to understand the need to acquire a broader and deeper orientation to computers rather than just obtaining the simple skills of learning which buttons to push.²⁸

The words reeducation and retraining, borrowed from Lipow, are used here to convey the idea that in the context of automation much more is needed than simple procedures training, particularly for professional librarians. Lipow expresses this concept best when she explains the differences between simple training and education, and reeducation and retraining:

education enhances awareness, knowledge and understanding; training seeks to change behavior. . .
. Reeducation requires the student to abandon con-

cepts that once were true, but no longer are; retraining requires the student to UNlearn what used to be a competency, but no longer is."³⁰

Only theory based, usually formalized, training methods (see table 1) can be acceptable as an adequate means of reeducation and retraining, and of providing librarians with a deeper understanding of where technology fits into the holistic concept of the library profession. If librarians attempt to learn new skills while retaining old procedures, systems and values then librarians and their organizations are not really changing. From researchers like Ellen Bernstein and John Leach, to practitioners like Mary Larson and Betsy Baker, a belief is expressed that acceptable reeducation and retraining can only be realized through the attainment of a theory based cognitive framework of automation which is acquired only from formalized educational programs.³¹

Apparently the potential impact of the new interactive computer technologies on the reeducation and retraining process can be enormous. But the questions raised in the literature as to the current state of continuing education in the face of automation indicates that the potential is not being realized

TABLE 1

LEARNING METHODS	ADVANTAGES	DISADVANTAGES
Self-instruction	cost	no interaction no theory base
In-house (one-to-one)	all on site individualized cost	personality clash no theory base
Workshops	time expertise latest systems	little interaction travel cost
Conventions	some interaction expertise high some theory	little depth little theory travel cost
Formal courses	cognitive framework interaction high expertise technology theory and systems	travel high cost takes time
Network Courses	on-site theory base expertise time	cost little interaction

THE ADVANTAGES AND DISADVANTAGES OF VARIOUS FORMS OF CONTINUING EDUCATION IN RELATION TO TECHNOLOGY.²⁹

in practice. Therefore the important facets in reeducation and retraining that require measurement to help determine the impact of the new interactive technologies might be the quantity and the quality of training received by librarians combined with how recent

the librarians have received the retraining.

EMOTIVE

The fourth category examined from the literature comes under the heading of emotive. The higher the measurable emotional response to automation, either negative or positive, then the higher the degree of impact interactive computer technologies are having on libraries. The willingness of the librarians to accept or reject a new process or idea, such as adopting interactive computer technology into their library, can go far toward determining the sort of actual changes that will ultimately take place in a library organization.

Five or ten years ago when many libraries were first getting acquainted with automated systems the literature was rife with debate about staff resistance to automation on the grounds that automation would somehow subvert the human element in the library organization. There is still concern, expressed by Baker and Sandore, that "the introduction of automation, is, for many librarians, a threat to perceptions of professional competence, job security, knowledge base, and self."³² Likewise, John Olsgaard writes, "the intro-

duction of computer-based systems can be a stress producing experience."³³ Library management must be prepared for staff conflict and resistance to automation.

Other studies show however, that there is less evidence than previously thought that library staffs resist automation. Benham tells us that "far from fearful of change, today's library personnel chafe at constraints which limit the ability of their libraries to take advantage of technologies viewed as valuable in improving productivity and services."³⁴ It may be helpful in settling this issue if one of the variables measured could be a direct question of the librarians themselves as to their satisfaction with the new interactive computer technologies.

PATRONS

The last category examined was that of patrons. After all it is presumably for the patron's ultimate benefit that libraries are acquiring the new interactive computer technologies in the first place. Ostensibly the idea is that the new interactive computer technologies will increase the quantity and quality of services to patrons. Leigh Estabrook believes that "the most significant measure employed to increase

productivity has been the rapid adoption of technology."³⁵ The library that embraces the new technology, Reynolds asserts, will do so because of:

1. Increased processing efficiency
2. Lower operating costs
3. Improved library services
4. Reorganizational implications
5. Necessary response to a breakdown of crisis proportion in the existing manual systems
6. Facilitation of the sharing of resources
7. Improvement of library administration and management
8. Automation for its own sake³⁶

The benefits to end users will be manifold. Miller and Gratch agree that automation will leave libraries with "generally improved service."³⁷

The theory is that the new interactive computer technologies, as discussed in the reeducation/retraining category, will standardize tasks, freeing professionals to become more involved in systems design and patron services. Benham views the advent of the new interactive computer technologies as an opportunity to redistribute and utilize our "resources wisely in the quest to serve clients more effectively."³⁸ Each library must examine the incorporation of automation into its organization in the light of each institution's mission - a mission that the existence of our

profession dictates will be predicated on the idea of service to the patron.

However, there is some trepidation evinced in the literature that automation may not exhibit the kind of or depth of benefits that might be expected. William Miller and Bonnie Gratch, speaking of automation in the reference area, believe that a comparable amount of work time will be spent in instruction and upkeep of the technology, and that automation will not save librarians "appreciable amounts of time."³⁹ Perhaps the telling variables that need to be measured for this category are the extent to which patrons are responding to automation in the library, and the extent to which staff, and most particularly professionals, are gaining more time to expend directly on patrons as a result of the routinizing of tasks which automation is purportedly doing for libraries.

REVIEW OF PREVIOUS RESEARCH

As alluded to in the previous part of this literature review, there is much rhetoric in the literature about the impact of the new technologies on libraries, yet the research done to lend sufficient credence to some of the suppositions explored earlier is of limited

extent and variety. Assuming that the new technologies are causing a constant state of expansion, turmoil and impetus for change, then only recent efforts would retain enough validity to be used as models for the design of new survey instruments such as the one proposed for this paper. However, there are few research efforts extant on the impact of the new interactive computer technologies in libraries. In the search done for this paper only one recent research effort was found that ostensibly addressed the impact of the technologies in relation to small academic libraries. That study was a dissertation completed by Tina Shou-Mei Cheng Fu at the University of Wisconsin in 1988.

For this review of previous studies only a total of four research efforts were chosen for closer examination as possible models upon which to pattern the survey instrument for this study. The first two research projects were examined only briefly since their information is becoming outdated, having been completed in 1984 and 1985 respectively.

The oldest research effort examined was an Academic Research Libraries (ARL) generated project undertaken by B. J. Busch in 1984 entitled "Automation and Reorganization of Technical and Public Services."⁴⁰

was examined because: 1. the sample size and return were good; 2. only academic libraries were studied; 3. it included mostly original material generated by the respondents; and 4. its brief conclusion was that there is little evidence of wholesale organizational changes taking place due to automation. The problems with this effort were: the currency of results, the apparent lack of statistical testing, surveys only very large academic libraries, and focuses only on the one general question of overall organizational change caused by the embracement of new technologies.

Busch put together a brief survey instrument which elicited 82 responses of which 46 indicated they were still, as of 1984, organized along the traditional departmental lines of separation between technical and public services thirty-six respondents reported some integration of these departments and services. Integrated systems, made possible by the new technologies, was ranked in this survey as having the greatest impact on reorganization.

Oddly a number of the returns indicated that no changes were taking place in their libraries because of automation, and yet automation seems to be making

changes in these institutions anyway, even if not in the overt organizational charts.

Exemplifying this oddity were two responses, one from Boston University and one from the University of California. First, from Karin Begg, Associate Director of Boston University Libraries, there was issued a sort of administrative disclaimer in response to the survey, that technology is not causing any changes in that library. She states, "the enclosed questionnaire and documents do not reflect reorganization directly in response to automation, and thus may not relate to the survey at hand."⁴¹ All of the documents from Boston University that follow this disclaimer precede to discuss how technology can be infused into the various departments and how these departments and job descriptions must change to accommodate it. The second example is from Rita A. Scherrei, Director of Administrative Systems and Personnel Services at the University of California, Los Angeles. Scherrei responded to the survey by saying, "the extensive automation effort of the last several years has not resulted in any formal reorganization of our staff. In fact, our philosophy has been to alter the work done in a job, not the person holding the job or the reporting

relationships involved."⁴² Scherrei admits to no formal changes, but if work design systems are being altered, isn't that change?

The results of this research effort indicate that organizations with traditional structures, systems and values are not only resisting change, but that rigid traditional structures and values may be desirable to retain, at least from the management's perspective. Technology is having no impact on these organizations. The real question might be that if the people responsible for working the technology are not reeducated or retrained, then just how good a fit can the traditionalist staff make with the new technologies? Based on these kinds of responses, Busch concluded in 1984 that automation is having no significant impact on the organizational structure of libraries.⁴³

The second research effort examined was conducted by Ganga Dakshinamurti in 1985. This effort included a well designed survey instrument that structurally proved very helpful in the construction of a new instrument, but was substantially less helpful in content and results. The Dakshinamurti study was examined because of: 1. a good sample size; and 2. the hypothesis formulation appears to be particularly relevant to

ascertaining the impact of the new technologies on libraries. What made this study less than useful however, was: 1. the study was conducted in Canada; 2. all types of libraries were surveyed, large, small, public and academic, which undoubtedly skewed the results in terms of usefulness for a possible comparison of results with a study centered around the controlled variable of size; and 3. there were a number of old issues discussed which no longer appear to warrant much attention.

Dakshinamurti's survey instrument included 118 persons. The relevant hypotheses presented with the findings were:

1. Computer applications in libraries are welcomed by library staff, as they reduce the number of repetitious tasks and enable faster results. Finding: This was considered proven as a correct statement by the survey.
2. Acceptance of automation is in direct proportion to the number of years of formal training. Finding: This was considered to be not significant by the survey results.

3. There is some concern among library staff members about ergonomic factors when using automation.
Finding: This was considered to be of not much concern to librarians by the results.
4. Library automation will lead to a blurring of hierarchical lines in libraries because of the diffusion of the decision-making process.
Finding: Contrary to Busch's report it was found that hierarchical lines are tending to blur.
5. There will be a reduction in interpersonal communication. Finding: This was found likely to be true.
6. Automation will lead to a loss of certain types of jobs and changes in others. Finding: Again contrary to Busch's conclusion, it was found that considerable change is expected in the job structure of many staff members.
7. Participatory and consultative styles of management will help most in having staff accept automation readily and smoothly, since implementation of automation brings about major changes in libraries. Finding: The conclusion here was that participatory management should be a pre-condition to automation.⁴⁴

Dakshinamurti's overall conclusion from the study was that the "effects of technology on library personnel can be both positive and negative. Ultimately what will prevail will depend on managerial decisions and the staff training provided."⁴⁵ The inference from Dakshinamurti's study is that many changes are indeed occurring in libraries due to automation with the two big concerns being the resistance of management to change and the adequate training of personnel. Both of these elements which were carefully considered in the design process of the survey instrument in this research effort.

The third study examined was a survey completed by Dorothy E. Jones, of Northern Illinois University, in 1989. The survey instrument was applied to just three academic libraries, and all three libraries in the study varied widely by size. Unfortunately, it would be difficult to construe a sampling of just three libraries to be a significant sample size. Perhaps Jones does not present us with a convincing random sampling, but her well designed questionnaire and resultant analysis of data were well done and relevant to the proposed study under consideration here.

The Jones' survey instrument was in the form of a short questionnaire which attempted to ascertain the effects of technology only on support staff or non-MLS personnel. Jones was proceeding from the assumption that "paraprofessional and clerical employees comprise the bulk of library staffs, and they spend more time working directly with computers than do most librarians."⁴⁶ Unfortunately, the resultant statistics varied so much from library to library due to the limited sample size that their usefulness is questionable. However, the fact of the wide variance existing in the collected responses between the one large, one medium, and one small academic library, supports the need to repeat her kind of study while isolating the control variable of size.

Jones asked a number of background questions based on education, area of interest and work experience. This may have been done in an attempt to establish other kinds of independent variables that might affect the results. Otherwise, her questionnaire concentrated on support staff perceptions of the new technologies in terms of feelings, ease of use, improved production, satisfaction with training, resistance, job descriptions, staff size, and participatory management.

Her findings are not easily summarized, as mentioned, due to the high degree of variance in responses. Generally Jones notes that there is a positive attitude toward automation, but with still some frustrations evident among support staff.⁴⁷ The need to move faster into the new technologies is supported in her survey, although 47% of her respondents thought that the new technologies have had no effect on them good or bad.⁴⁸ Yet, in her brief ending comments Jones speaks of the impact of technology as a transitory change process--in effect an inevitable change process for all libraries.

In terms of structural design and clarity of questions asked in the survey instrument, the Jones' study proved the most helpful even though here again it would be difficult to compare possible results between a survey concerned with support staff and a survey concerned with institutional size as the control variables.

The last study to be examined was the Fu study mentioned earlier. The Fu study was the only one found that specifically addressed the question of the effects of the new technologies in small academic libraries. Originally the author gave consideration to duplicating Fu's research effort and then comparing results; how-

ever, some flaws surfaced in a closer examination of Fu's effort that precluded this idea.

The Fu study was a limited survey of fourteen libraries based on the size of staff. The parameters for her select sample group were seven professional staff members and the embracement of automation in those libraries in four of nine identified technological dimensions or library automation systems. The study, limited to Wisconsin, sought to gauge the impact of computer technology in the categories of 'Behavior change', 'Rule change' and 'Structure/Power change'. As a result of this study, Fu agreed with Busch that the new technologies are having minimal effect on the organizations of small academic libraries.⁴⁹

The select sample used by Fu is highly suspect for purposes of drawing any general statistical inferences for small academic libraries. Taken alone, Fu's study, confined as it was to only fourteen libraries from a limited geographical area, could be considered to have reduced statistical significance for other libraries. However, a more serious flaw emerges in Fu's study when it is discovered that ten of the fourteen libraries surveyed are revealed as not actually being separate entities in their own right, but merely remote exten-

sion branches of the huge University of Wisconsin Library System. In a sampling like this the results are not just diluted by the umbrella effect of a larger system, but may evince no value for other small academic libraries.

Fu begins with the assumption that the new technologies alone are responsible for the evolution of libraries from traditional systems to open systems. In her opening statements she reveals this by saying, "the changing relationship between libraries and their environment is by far the most visible effect of computer technology on libraries. One might say that these organizations have evolved from fairly closed and insulated systems to open ones."⁵⁰ Her conclusion comes from a review of literature saturated entirely by case studies of large academic library organizations.

As a result of her work however, Fu found very little significance in her statistical analysis between change and the impact of technology. In testing for technology as a democratizer she says that:

There did not seem to be a more open process of information sharing, or more participation in planning except in isolated dimensions. . . . There seemed to be no significant changes in job roles caused by computer technology. . . . workers felt that there was no 'luster' added to their jobs by

computers. . . . [and] they did not feel that workers got the same training as the administrators.⁵¹

In testing for technology as a rule changer Fu concluded that, "computer technology was not perceived as having caused changes" in rules, structure/power, or behavioral levels.⁵² Moreover she continues, "it does not seem that computer technology had contributed in opening up the organization to be less hierarchical and more flexible, the type believed to be more suitable for the new information age."⁵³

SUMMARY

The concern shown in the literature about the technological impact on the organizations of libraries and on librarians is greater than what may be suggested by the length of the review here. From this review, however, the clear consensus comes through that automation is creating in libraries an atmosphere of evolutionary change if not that of revolutionary change. Certainly it is clear that the new technologies have had a tremendous impact on library literature. The question is have the concerns voiced in the literature been adequately substantiated by tangible research data? The few research efforts found that might support the suppositions made in the literature, like Fu's

study - which despite a number of design problems in the survey instrument - seem to contravene the literature. This is why the question of the impact of the new interactive computer technologies warrants further systematic study such as the one undertaken here.

Although the literature is prolific on the subject, the evident paucity of hard research in this area, as pointed out by people like Baker, Dorothy Jones and Tina Shou-Mei Cheng Fu, particularly as the impact of the new interactive computer technologies are related to size, has hindered the construction of a strictly controlled, hypothesis-testable, survey instrument for the study under consideration. Possible variables have been discussed and identified in the course of the literature and in the previous research review. These variables should be included in an instrument designed to measure the impact of the new interactive computer technologies in small academic libraries. Some of the variables that will be included in this survey instrument are: extent of automation, planning, patrons, job descriptions, training, ergonomics, partnership in management, rewards, and resistance. Discussion of the design, implementation

and analysis of the results of the survey instrument will follow in the next two chapters.

NOTES

1 John N. Olsgaard, "Automation as a socio-organizational agent of change," *Information Technology and Libraries*, 4, No. 1 (1985), p. 21.

2 Olsgaard, p. 21.

3 See, *Human Aspects of Library Automation* by Marvin J. Dainoff, 1987; and "Automation's effect on library personnel," by Ganga Dakshinamurti, *Canadian Library Journal*, (December 1985).

4 See, Charles Martell, Jr., *The Client Centered Academic Library*, (Westport, CN: Greenwood Press, 1983); and Tom Peters, *Thriving on Chaos*, (NY: Harper & Row, 1987).

5 Dennis Reynolds, *Library Automation*, (NY: R.R. Bowker, 1985), p. 227.

6 De Klerk Ann and Joanne R. Euster, "Technology and Organizational Metamorphoses," *Library Trends*, 37, No. 4 (Spring 1989), p. 464.

7 Leslie M. Kong, and R.A.H. Goodfellow, "Charting a Career Path in the Information Professions," *College & Research Libraries*, 49, No. 3 (May 1988), p. 209.

8 De klerk, p. 465.

9 Frances Benham, "Challenges for Information Services Librarians to Meet the Needs of an Information-Based-Society," *Journal of Library Administration*, 10, No. 4 (1989), p. 34.

10 Donald G. Frank, "Allocation of Staff in the Academic Library," *Journal of Library Administration*, 10, No. 4 (1989), p. 56.

11 Kong and Goodfellow, p. 209.

12 Roberts and Konn, p. 125.

13 Stephen P. Robbins, *Organization Theory*, (Englewood Cliffs, NJ: Prentice-Hall 1987), p. 145.

14 Leigh Estabrook, "Productivity, Profit, and Libraries," *Library Journal*, 106 (July 1981), p. 1378.

15 Kong and Goodfellow, p. 211.

16 William Miller, and Bonnie Gratch, "Making Connections," *Library Trends*, 37, No. 4 (Spring 1989), p. 388.

17 Karen L. Horny, "Managing Change," *Library Journal*, (October 1, 1985), p. 58.

18 Horny, p. 57.

19 Anne Grodzins Lipow, "Training for Change," *Journal of Library Administration*, 10, No. 4 (1989), p. 87.

20 Peters, p. 387.

21 Benham, p. 44.

22 Reynolds, p. 270-271 and Martell, p. 32.

23 James Rettig, "Options in Training and Continuing Education," in *On-line Searching Technique and Management*, ed. James J. Maloney, (Chicago: ALA, 1983), p. 151.

24 Horny, p. 56.

25 Lipow, p. 89.

26 Carolyn M. Gray, "Technology and the Academic Library Staff or the Resurgence of the Luddites," in *Professional Competencies - Technology and the Librarian*, ed. Linda C. Smith, (Champaign, IL: University of Illinois, 1983), p. 75.

27 Delmus E. Williams, "Designing Jobs for Changing Libraries," in *Operations Handbook for the Small*

Academic Library, ed. Gerard B. McCabe, (NY: Greenwood Press, 1989), p. 52.

28 Albritton and Shaughnessy, p. 6.

29 Revised and updated from table in Rettig, p. 150.

30 Lipow, p. 88.

31 See "Plateau," by Ellen Bernstein and John Leach, *American Libraries*, 16, No. 3 (March 1985), p. 178-180; "Reference Librarians," speech by Mary Larson given at Emporia State University, April 1990; and "Motivation in Turbulent Times," Paper by Betsy Baker and Beth Sandore, Northwestern University, Evanston, Illinois, 1990, p. 14.

32 Baker and Sandore, p. 10.

33 Olsgaard, p. 22-23.

34 Benham, p. 35.

35 Estabrook, p. 1378.

36 Reynolds, p. 208.

37 Miller and Gratch, p. 395.

38 Benham, p. 36.

39 Miller and Gratch, p. 398.

40 B. J. Busch, *Automation and Reorganization of Technical and Public Services*, (SPEC Kit # 112, Washington DC: Association of Research Libraries, Office of Management Studies, 1985).

41 Busch, p. 1.

42 Busch, p. 34.

43 Busch, p. ii.

44 Dakshinamurti, p. 344-345.

45 Dakshinamurti, p. 346.

46 Dorothy E. Jones, "Library Support Staff and Technology: Perceptions and Opinions," *Library Trends*, 37, No. 4 (Spring 1989), p. 432.

47 Jones, p, 449.

48 Or the respondents had no opinion which in factoring can be construed as the same difference as perceiving no changes due to the automation; Jones, p. 437 & 447.

49 Tina Shou-Mei Cheng Fu, "The visible and invisible hand of computer technology in the library organization," Diss. University of Wisconsin, 1988, from abstract.

50 Fu, p. 5.

51 Fu, p. 150.

52 Fu, p. 153.

53 Fu, p. 153.

CHAPTER THREE: THE RESEARCH DESIGN

QUESTIONS

The literature review was undertaken to help identify possible areas of concern in the impact of interactive computer technology for small academic libraries. A survey instrument was devised and distributed which was used to gather data that may tend to either validate or invalidate the rhetoric, supposition, and previous research done in this area. Some research questions raised by the review were:

1. Is new technology changing job descriptions?
2. Are librarians adjusting to the new roles demanded of them by the new technologies?
3. What is the impact of the new technologies on staffing patterns?
4. What level of training are staff receiving to operate the new technologies?
5. What is the extent of existent automation?

6. What are the rewards for the librarian in the new technology onslaught?
7. Are staff making the attitude adjustments necessary to accept the changes imposed by the new technologies?
8. Has a team concept or participatory style of management permeated libraries which have embraced the new technologies?
9. Have the changing work systems imposed by automation made job positions flexible to better serve patrons?
10. Are patrons receiving more attention as routine tasks are being turned over to para-professionals?

THE STUDY

As demonstrated by the literature review and the few attendant research efforts, there were few comprehensive patterns of inquiry available upon which to model this proposed study. Yet, there were recognizable pertinent elements to the question of automation impact discerned from all aspects of the literature explored. This study is an effort at filling the gap in the lack of information available on small academic librarian's perceptions with regard to

the impact of interactive computer technology in their libraries.

For this study, a survey instrument was designed in the form of a questionnaire. The questionnaire first asked a number of questions intended to generate a descriptive profile of the sample population. Secondly, the questionnaire presented questions grouped around the previously discussed categories of:

- 1.) planning/policy; 2.) job descriptions/rewards;
- 3.) emotive; 4.) reeducation/retraining; and
- 5.) patrons.

As far as possible while operating under the constraints of certain limitations and assumptions (explained below) this survey was planned and executed according to accepted research procedures as outlined in Natalie L. Sproull's Handbook of Research Methods.¹ The procedures used in defining the parameters of the survey were: 1) distribution of the survey to a pre-test sample group; 2) distribution of the survey to a relatively large population group; and 3) distribution of the same questionnaire to all subjects.

This study was based on the size of the academic libraries sampled. The parameter of size was defined as the total student enrollment or head-count, not full-time equivalency, in each institution surveyed of

less than 6,000 students. This definition was chosen because the population group served more nearly reflects the measure of service demanded of a library. The figure of 6,000 as a limiting factor was arrived at for this study from the definition of a small academic library used by Baker and Pastine.²

The questionnaire was first distributed to a small pre-test group of 14 librarians. This pre-test group was not a random sampling, but was composed of class members from a Baker and Pastine seminar entitled *The Dynamics of Small to Medium Sized Libraries*, presented for the School of Library and Information Management at Emporia State University in Kansas, in the summer of 1989. The input of the pre-test group proved valuable, which as a consequence subjected the questionnaire to some revisions.

The revised questionnaire was then distributed to 101 librarians in 76 small academic libraries across a 13 state region. The states included in the survey were: Arizona, Colorado, Iowa, Kansas, Missouri, Montana, Nebraska, Nevada, North Dakota, Oklahoma, South Dakota, Utah, and Wyoming. This sample population group was not a random sampling either. Due to lack of time, funds, and experience, a readily avail-

able mailing list from the Mountain Plains Library Association was utilized for this sample. Every library that was easily identifiable as having student populations below 6,000 enrollment was included in the scope of the study. A respectable 84 responses were received for a return rate of 83 percent.

LIMITATIONS AND ASSUMPTIONS

As stated, the proposed study made use of the survey questionnaire. Abraham Bookstein says that a questionnaire as a survey instrument, used by itself, may not be the ideal instrument to use in an empirical study.⁴ The questionnaire was used alone in the instance of this study due to the constraints imposed by lack of money and lack of time. The assumption is that the questionnaire may be an acceptable method for the kind of preliminary study proposed here as long as the data uncovered is used carefully and not construed by the reader as any kind of definitive answers to some of the questions posed.

A number of assumptions were made in designing this survey. The major assumption is that the new paradigm model of library organization as represented in the literature is the trend, and perhaps even the

norm, in small academic libraries due to size and the embracement of the new technologies. Therefore, a positive approach was assumed: that the professionals in these institutions are striving to achieve, if they have not already done so, all of the elements represented by the proposed five categories of study.

It was assumed that every professional is at least aware of some of the potential automation may have in their libraries, whether they currently have fully embraced technology or not. There was an assumption that the librarian intended to fill out the survey did so as honestly as possible and that this task was not turned over to someone else.

Another assumption involved in using the survey questionnaire is that a librarian's perception is a valid reflection of actuality. A high percentage of the respondents are professionals and as such should understand the nature of questions and research. As professionals they have an understanding of the terms used, are familiar with research efforts, and understand the differences between the impact of technology and little or no impact.

It was assumed, although mentioned in the survey cover letter, that the librarian's understood that the

terms 'new technologies' and 'automation' referred to in this paper are the interactive computers now in use to facilitate the information transfer process with patrons. The principle mainstay of this automation is the computer and any processes involved in its use.

MEASUREMENT

The questions on the survey instrument were subjected to a statistics program called Kwikstat. Kwikstat was utilized to ascertain frequency distributions for all questions and detailed descriptive statistics for single variables.³ The frequency distribution for each question was converted to percentages for presentation of the results. The results, organized around the five categories, have been reproduced in graphic form for ease of comparison and discussion. The scores derived from the Likert scale were also subjected to a factor analysis (see appendix B) in order to reduce the results to a manageable format of an either "agree" or "disagree" pattern of responses. The Likert scores of numbers 1 (= strongly agree) and 2 (= agree) on the scale were factored as affirmations of the questions while responses with numbers 3 (= not sure), 4 = (disagree), and 5 = (strongly disagree) were

considered as negations (see questionnaire in appendix A). This factoring was based on the logic that if a respondent is "not sure" he/she is involved in a process than it is fairly certain that they are not.

Questions one through eight along with questions 28 through 30 were intended to be background questions, establishing a comprehensive description of the population sample. For the five categorical areas of concern the grouping of questions were as follows:

1. Planning/Policy - Questions: 11, 12, 13, 16
2. Job Descriptions/Rewards - Questions: 17, 18, 19, 22
3. Emotive - Questions: 21, 23, 27
4. Reeducation/retraining - Questions: 9, 14, 15, 30
5. Patrons - Questions: 20, 24, 25, 26

The methods for this study were chosen based on these outlined limitations and assumptions, with the purpose being to describe, explore, and uncover potential areas of serious concern in the impact of the new interactive computer technologies upon small academic library organizations and upon the librarians who work in those libraries.

Notes

1 See Handbook of Research Methods, by Natalie L. Sproull, (Metuchen, NJ: Scarecrow Press, 1988).

2 Betsy Baker and Maureen Pastine, "The Dynamics of Small to Medium Sized Libraries," LI 855, School of Library and Information Management Seminar, Emporia State University, 9-11 June 1989.

3 Abraham Bookstein, "Questionnaire Research in a Library Setting," Journal of Academic Librarianship, 11, No. 1 (March 1985), p. 24.

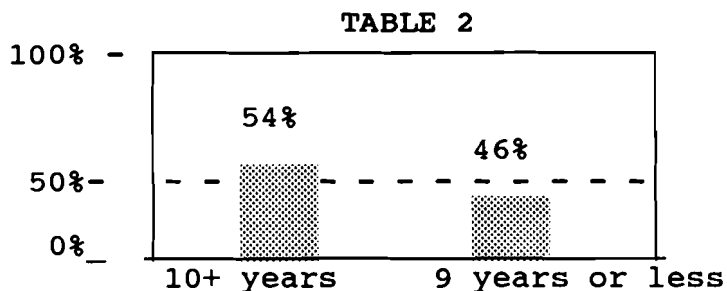
4 Kwikstat, Version 2.00, (Cedar Hill, Texas: TexaSoft, 1989).

CHAPTER FOUR: THE RESULTS

THE SAMPLE POPULATION

A description of the sample population group of librarians was disclosed from the responses to questions 1 through 8, 28, and 29. For complete information on the characteristics of the population group see Appendix A for the questionnaire and Appendix B for the frequency distributions.

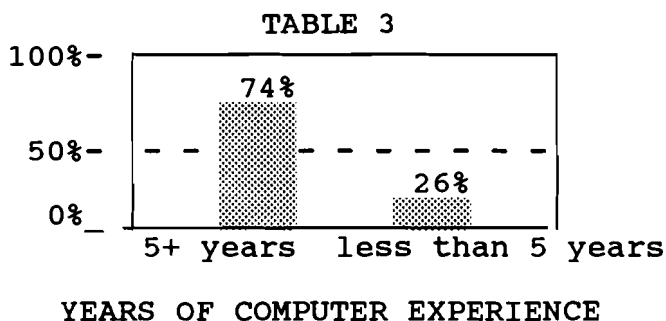
In terms of professionalism, as a group, 84.3% of the respondents have completed the MLS degree, while 15.7% have not. It was found that there were 36 directors and 47 non-directors responding to the survey, along with one unusable answer. There were a significant number of long term professionals responding to the survey, as 54% of the sample group have been professionals for more than 10 years while 46% have been professionals for nine years or less (see table 2).



NUMBER OF YEARS RESPONDENTS HAVE HAD A MLS DEGREE

Many of the respondents have been in library work for a long time. It was found that 69.9% of the respondents have worked in their current libraries for more than five years, while 30.1% have worked in their current library for five years or less. Also, 76% of the respondents were found to have been working in libraries for more than 10 years.

In terms of computer use, 96.3% of the sample group indicated that they are now using some kind of interactive computer technology. Three people responded that they do not now use interactive computer technology. At least 74% of the respondents have had more than five years of computer experience (see table 3). Furthermore, 77% of the respondents claim to have had formal classroom instruction in automation within the last two years.

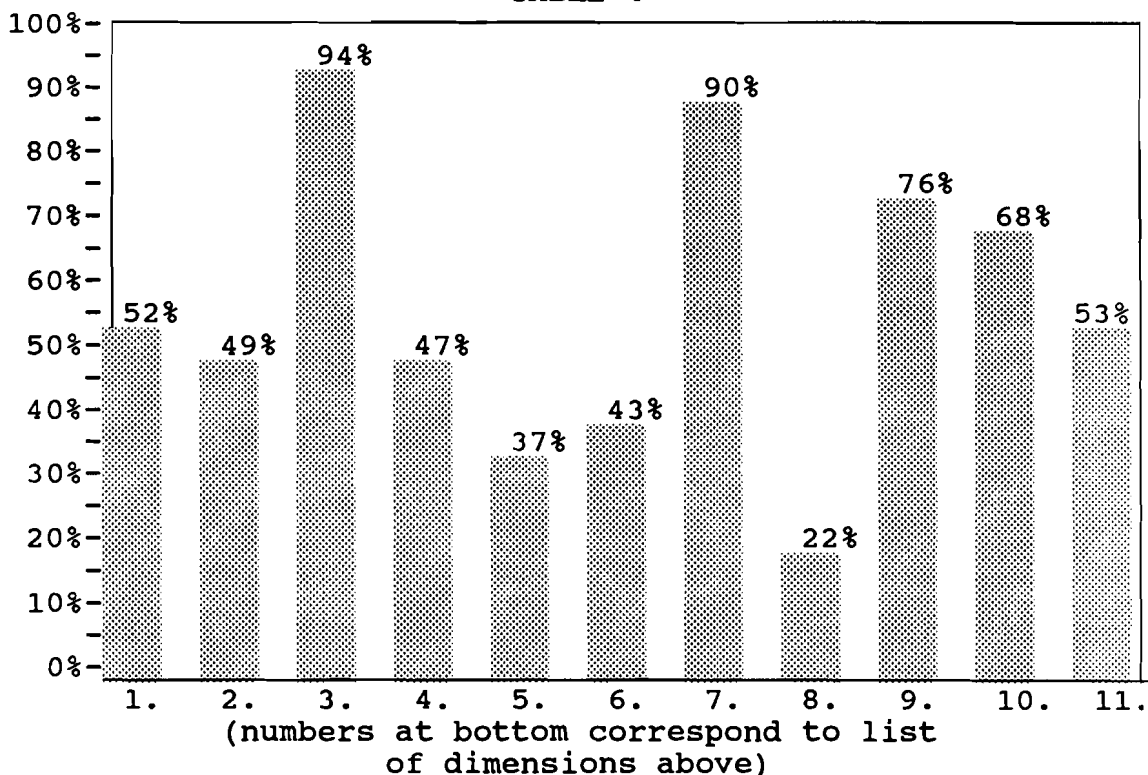


To ascertain the extent of the interactive computer technologies in the small academic libraries, the survey instrument made use of the nine dimensions of automation utilized by Fu, with modifications to include the dimensions of administration and the new dimension of networking. The dimensions and the responses (see table 4) are:

1. Acquisitions--material ordering; (52%)
2. Administration--wordprocessing, budgeting, (49%)
3. Cataloging--OCLC, etc.; (94%)
4. Circulation; (47%)
5. Serials--CD-ROM Reader's Guide, etc.; (37%)
6. Networking--multi-library catalogs, shared acquisitions, etc.; (43%)
7. Interlibrary Loan--OCLC, state catalogs, etc.; (90%)

8. Bibliographic or Library Instruction--end user programs on how to use the library, etc.; (22%)
9. On-line Searching--private database searches; (76%)
10. Reference--full-text dictionaries on CD-ROM, etc.; (68%)
11. Catalog (OPAC)--on-line public access catalog of library's holdings; (53%).

TABLE 4



EXTENT OF TECHNOLOGY IN SMALL ACADEMIC LIBRARIES.

Through a factor analysis of the answers, 61.4% of the libraries may be perceived as fully embracing the new interactive computer technologies. These are libraries that are at least partially automated in six of the eleven dimensions. Only two librarians indicated that their libraries were not at least planning to automate in less than six of the eleven dimensions.

Finally it was found that of the partial and complete automated systems (total of 483) in operation in the libraries of the respondents, 27% are accessible to patrons for their direct use. Patron services like OPAC's (86%) and Reference (77%) allow for the highest percentage of direct patron usage.

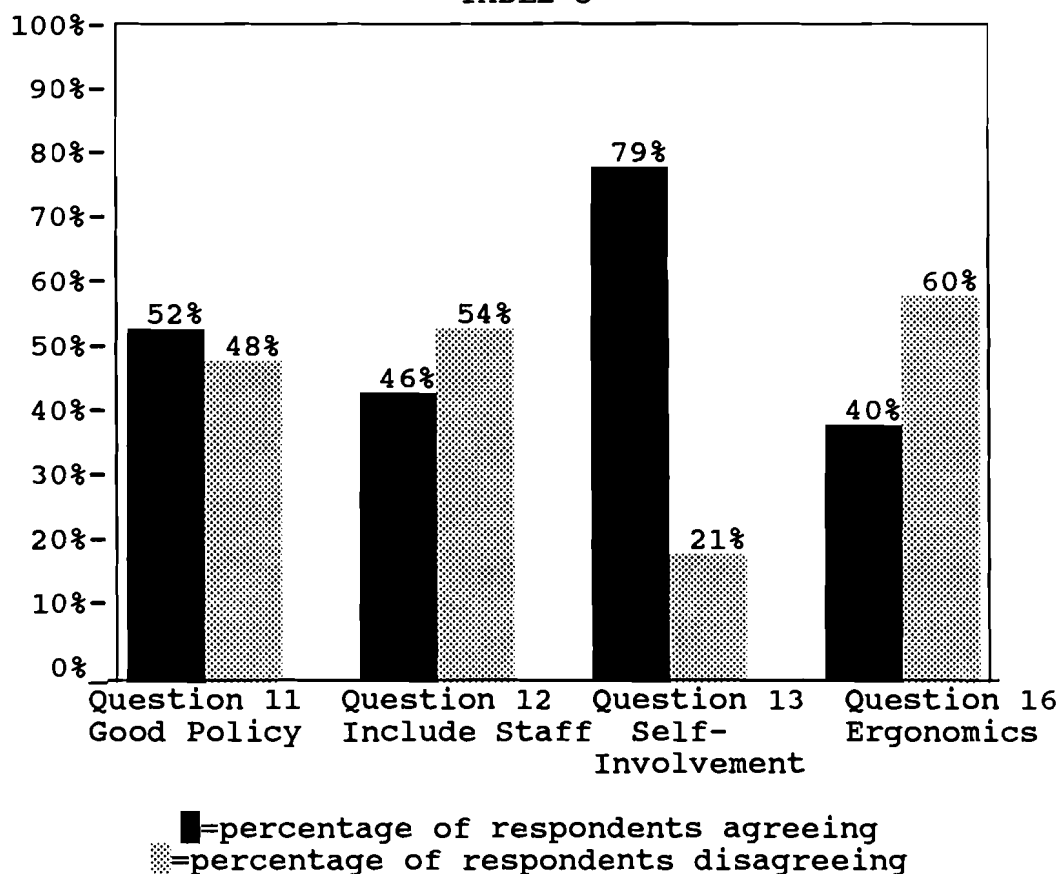
Presented next are the results of the survey grouped by the five categorical areas of: 1) planning/policy; 2) job descriptions/rewards; 3) reeducation/retraining; 4) emotive; 5) patrons (refer to accompanying graphs and appendix B).

PLANNING/POLICY

Questions 11, 12, 13 and 16 covered the category of planning/policy. Refer to table 5 as indicated in the following analysis of results.

Over 48% of the respondents reported that there is no comprehensive or good automation policy in their respective institutions (see table 5, question 11). Over 54% of the staff are reportedly being excluded from the automation planning and implementation process in the libraries surveyed (see table 5, question 12). 79% of the respondents report that they themselves are involved in the decision making process concerning

TABLE 5



EXTENT OF PLANNING/POLICY

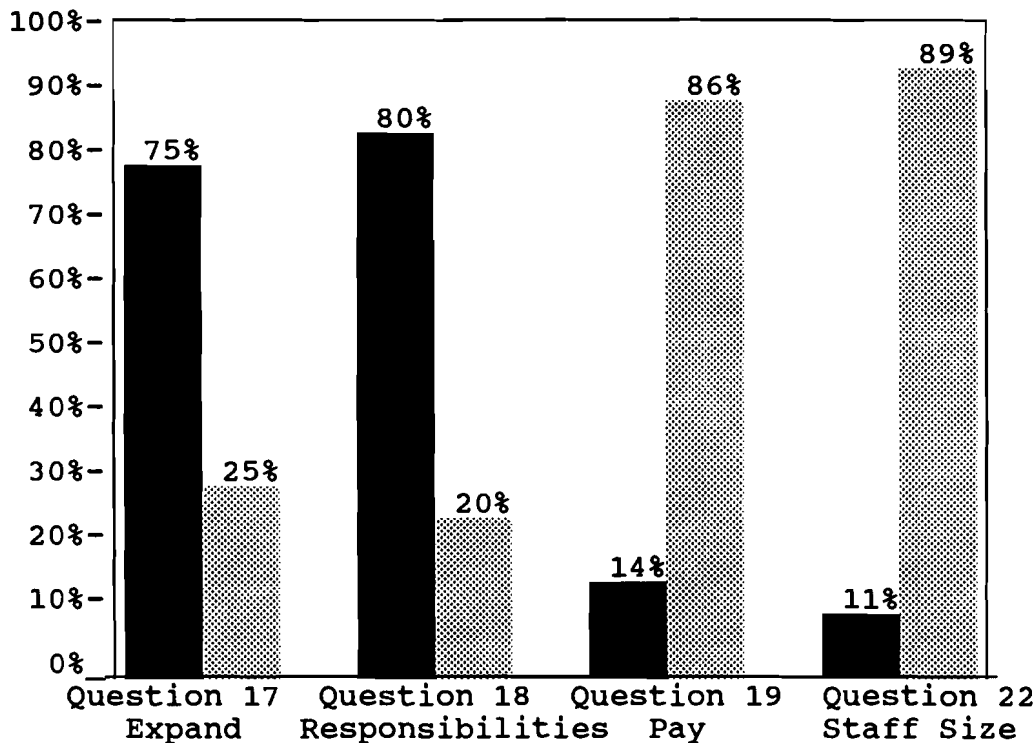
automation (see table 5, question 13). The responses to the last question in this group indicated that 60% of the librarians believe that their library's move to automation includes no regard for ergonomics (see table 5, question 16).

JOB DESCRIPTIONS/REWARDS

Questions 17, 18, 19 and 22 covered the category of job descriptions/rewards. Refer to table 6 as indicated in the following analysis of results.

Over 75% of the respondents reported that their job descriptions have expanded as a result of automation in their libraries (see table 6, question 17). Correspondingly, about 80% of the respondents feel that their responsibilities have increased as a result of automation (see table 6, question 18). However, nearly 86% of the respondents believe that they have received no compensatory rewards as a result of the increased work demands on them due to automation (see table 6, question 19). Also, 89% of the respondents believe that staff is not increasing in size due to automation in their libraries (see table 6, question 22).

TABLE 6



■=percentage of respondents agreeing
 ▨=percentage of respondents disagreeing

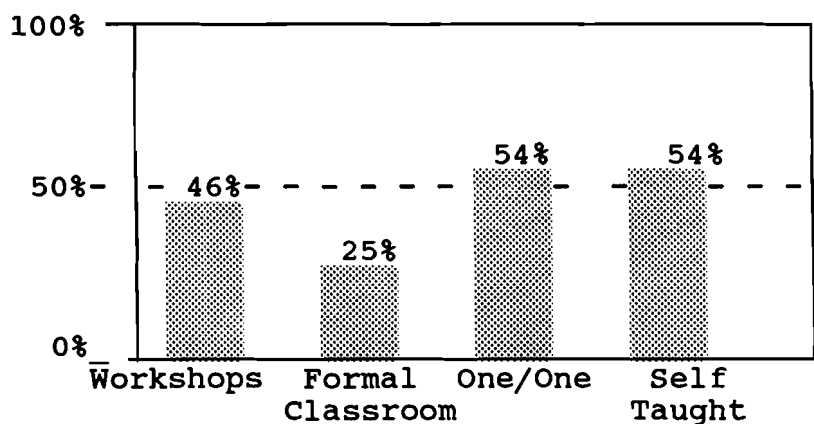
JOB DESCRIPTIONS/REWARDS

REEDUCATION/RETRAINING

Questions 9, 14, 15 and 30 covered the category of reeducation/retraining. Refer to tables 7, 8, and 9 as indicated in the following analysis of results.

The librarians were asked if they believed that they had received adequate automation training in each of four methods of training (see table 7). The four

Table 7

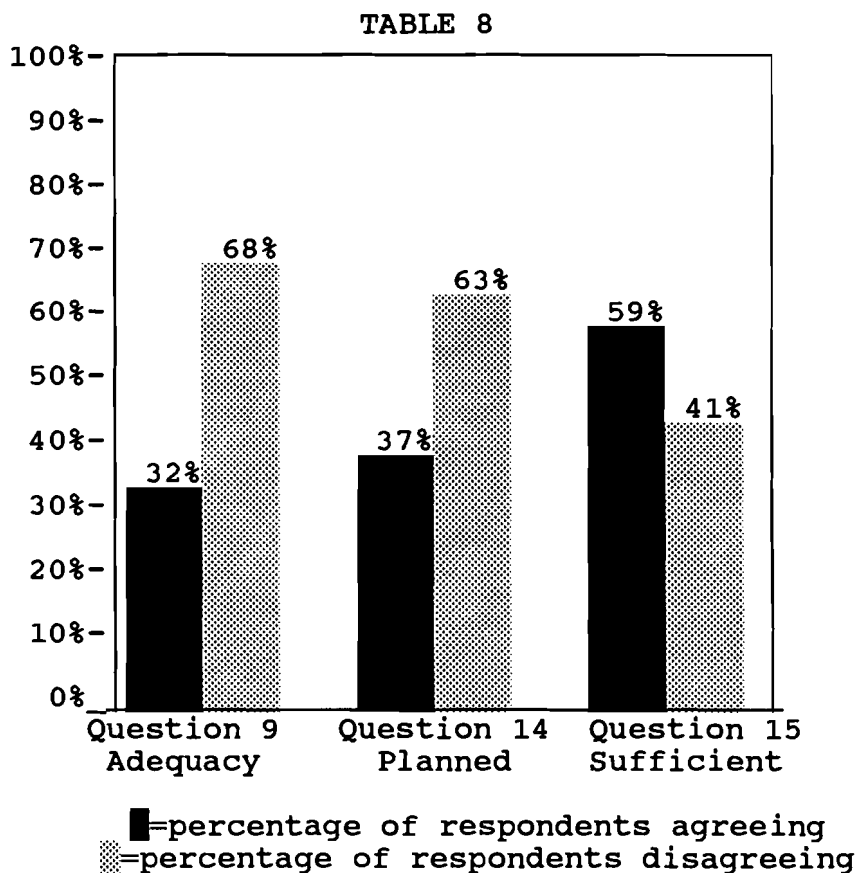


ADEQUATE TRAINING BY METHOD

methods of training are: 1) workshops; 2) formal classroom; 3) one on one; and 4) self-taught. Of the four methods, formal classroom training received the least positive response, with about 75% of the respondents perceiving that they do not have adequate formal classroom training in automation.

Given that formal classroom training carries more weight than self-taught training methods, the results were factored into those respondents who are perceived as having adequate automation training and those who do not (see table 8, question 9). The results indicate that only 32% of the respondents may be receiving adequate automation training.

Moreover, indicated by the responses to question fourteen, 63% of the respondents say that their libraries do not have adequate automation training policies (see table 8, question 14). Yet, at the same time, nearly 60% of the respondents believe that



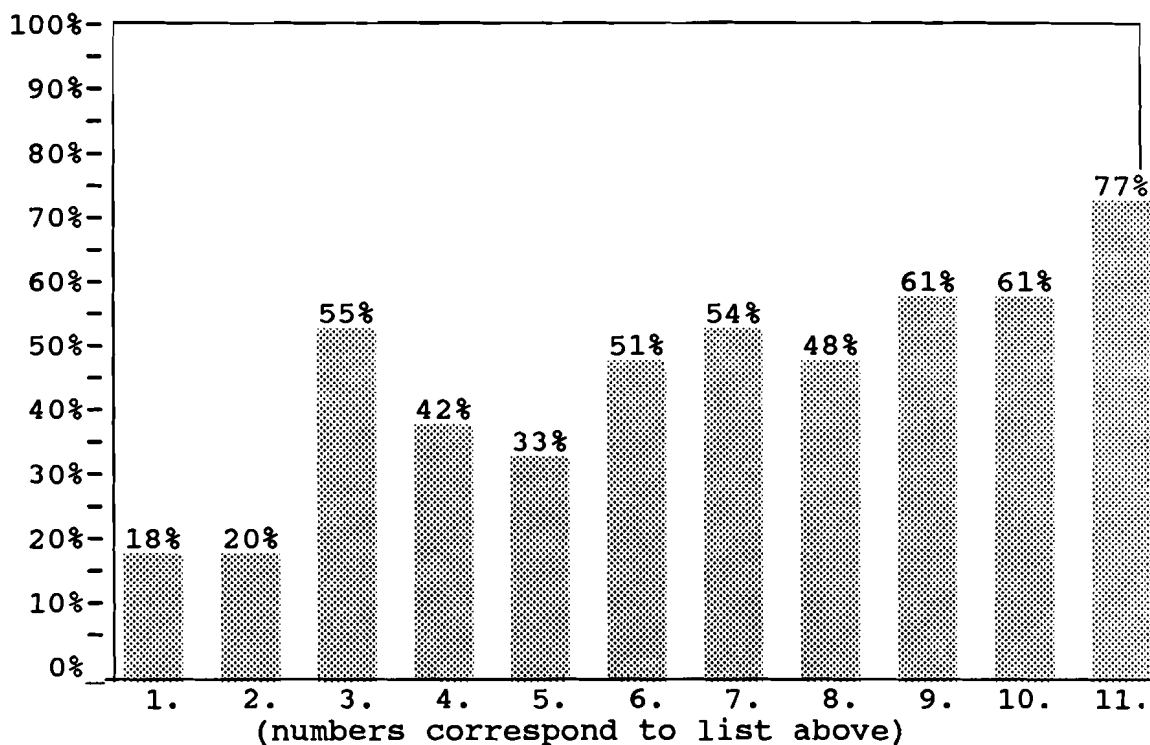
REEDUCATION/RETRAINING

their own automation training has been sufficient (see table 8, question 15).

The librarians surveyed were also asked in question 30, whether or not they were satisfied with the automation training they had received for each of the eleven dimensions of automation as previously discussed. Only those responses from librarians which indicated previously that a given dimension was present in their respective libraries were included in the results for this question. The degree of satisfaction of adequate training across the eleven dimensions of automation was (see table 9):

1. Acquisitions = 18% adequate
2. Administration = 20% adequate
3. Cataloging = 55% adequate
4. Circulation = 42% adequate
5. Serials = 33% adequate
6. Networking = 51% adequate
7. Inter-Library Loan = 54% adequate
8. Bibliographic Instruction = 48% adequate
9. On-line, database searching = 61% adequate
10. Reference = 61% adequate
11. On-line Public Access Catalog = 77% adequate

TABLE 9



PERCEIVED ADEQUATE TRAINING PER AUTOMATED DIMENSION

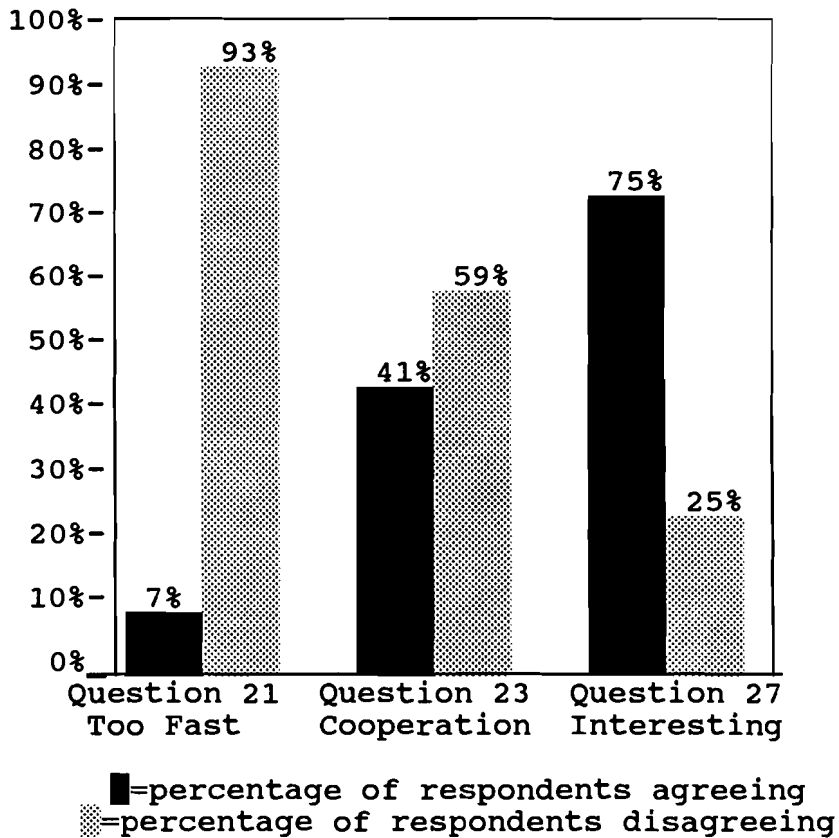
EMOTIVE

Questions 21, 23, and 27 covered the category of emotive. Refer to table 10 as indicated in the following analysis of results.

Nearly 93% of the respondents felt that their libraries are not moving too fast toward the embracement of the new interactive computer technologies (see table 10, question 21). 59% of the respondents report that there is no increase in

internal staff cooperation due to automation (see table 10, question 23). Over 75% of the respondents report that they are no longer resistant to the new technologies (see table 10, question 27).

TABLE 10



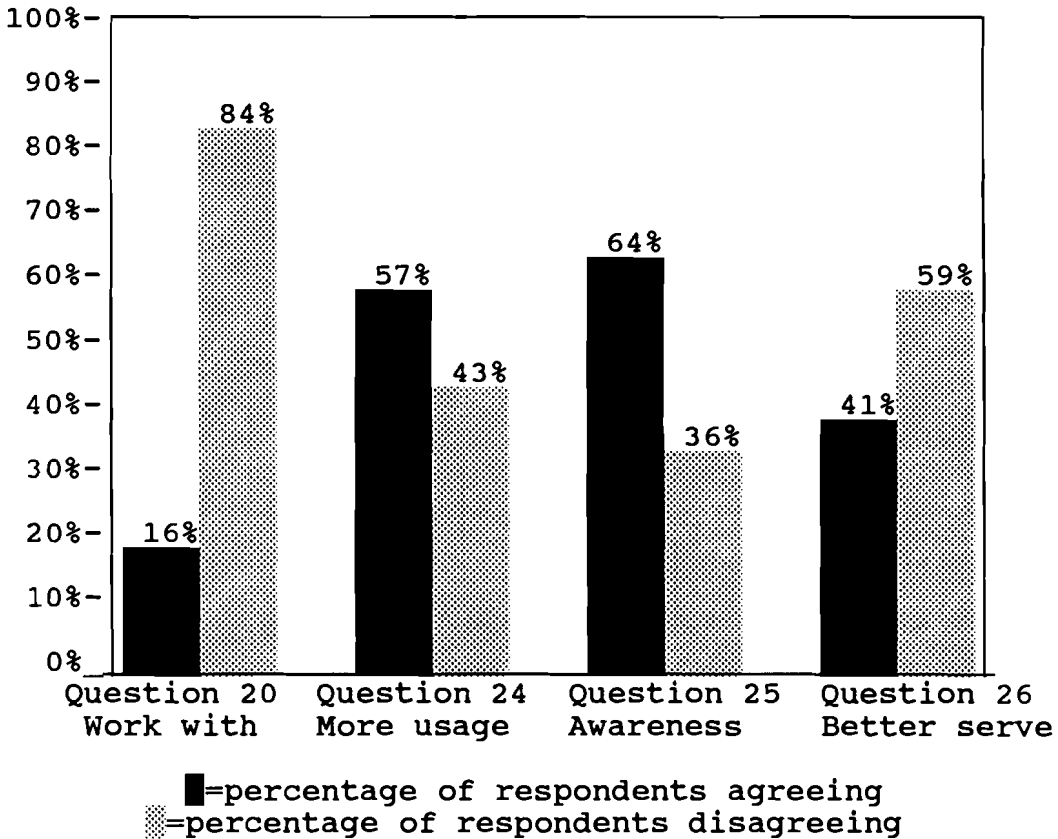
EMOTIVE

PATRONS

Questions 20, 24, 25, and 26 covered the category of patrons. Refer to table 11 as indicated in the following analysis of results.

About 84% of the respondents reported that they do not have more time to work with patrons (see table 11, question 20). While 43% of the respondents reported that automation was not increasing patron

TABLE 11



PATRONS

usage of the library (see table 11, question 24). This figure includes a large 29% who were not sure if patron usage of the library was increasing or not.

Only 6% outright reported that automation is not increasing campus awareness of the library while 26% weren't sure. 64% of the respondents did however indicate that awareness of the library has increased as a result of automation (see table 11, question 25).

Nearly 60% of the respondents believe that automation is not allowing them to spend more time with patron related services and processes (see table 11, question 26).

CHAPTER FIVE: CONCLUSION

SUMMARY

The results of this survey were obtained from 84 returned questionnaires for a return rate of 83%. A copious amount of data was collected from these results. The focal point of this study has been to measure the perceptions of the librarians concerning the impact of interactive computer technology in the specific areas of planning, participatory management, ergonomics, job descriptions, staff size, resistance, service to patrons, internal cooperation, rewards, and training. These areas have been grouped and graphed under the broader categories of: 1) planning/policy, 2) job descriptions/rewards, 3) emotive, 4) reeducation/retraining, and 5) patrons.

Although a non-scientific research effort, in consideration of the high return rate, the experience and professionalism of the respondents, (see table 2) and the high familiarity and usage of interactive computer

technologies by the respondents (see table 3), a few tendencies or conclusions about the impact of the interactive computer technologies can be tentatively identified. Given the above, the breadth and scope of the information produced may help to answer the original research questions, subject of course to confirmation from future studies. In sum the answers to the original research questions would be as follows:

1. Is new technology changing job descriptions? Yes, job descriptions are expanding and are including more responsibilities as a result of the new computer interactive technologies (see table 6).
2. Are librarians adjusting to the new roles demanded of them by the new technologies? Yes, there is virtually no conspicuous evidence of resistance to the new technologies in the small academic libraries. These small academic librarians want as much automation as they can get as fast as they can get it (see table 10).
3. What is the impact of the new technologies on staffing patterns? There is very little impact on staff size or on the organization of staff in the small

academic libraries as a result of the new interactive computer technologies (see table 6).

4. What level of training are staff receiving to operate the new technologies? Automation training for librarians in the new interactive computer technologies has been inconsistent, and far from complete in relation to the rate of automation acquisitions (see tables 7, 8 and 9).

5. What is the extent of existent automation and who uses it? The extent of automation is exceptionally high, particularly in technical services which can be considered virtually complete (see table 4).

6. What are the rewards for the librarian in the new technology onslaught? There are no concrete rewards from the advent of automation in the small academic libraries despite expanded job descriptions due to the imposition of the new interactive computer technology (see table 6).

7. Are staff making the attitude adjustments necessary to accept the changes brought about by the new

technologies? Yes, librarians evince a great deal of satisfaction with the new interactive computer technologies, despite incomplete participation in decisions, lack of quality training, no monetary rewards and expanded job descriptions (see table 10).

8. Has a team concept permeated libraries which have embraced the new technologies? The team concept has only partially permeated small academic libraries which have embraced the new technologies. Although planning and participatory management concepts have arrived in nearly half of the small academic libraries studied, these are ideas that may require more attention (see table 5).

9. Have the changing work systems imposed by automation made job positions flexible? Possibly not. It appears that many of the small academic libraries may still be adhering to traditional organizational structures which preclude internal staff cooperation (see table 10).

10. Are patrons receiving more attention as tasks are becoming routine? No, in small academic libraries,

librarians generally have less contact with and have less time to deal with patrons in the new interactive computerized environments (see table 11).

CONCLUSIONS

If the data generated by this study may be construed as being representative of all small academic libraries, the immediate overall conclusion to be drawn from the results are that the interactive computer technologies are having a profound impact on the librarians and thereby upon the organization and operations of small academic libraries. Determining the significance of this impact for the future well-being of these types of libraries is another matter.

For instance, the impact of the interactive computer technologies on the job descriptions and emotions of the librarians appears to be tremendous, if somewhat contradictory when compared. Illustrated by table 6, with the influx of automation, job descriptions have expanded by 75%, and job responsibilities have increased by 80%. Yet, there is a distinct lack of increased rewards and benefits for the librarians, with 86% seeing no corresponding increase in rewards. Despite this apparently significant increase on the

work loads of the librarians and the lack of rewards, it is depicted in table 10, that 93% of the librarians believe that their libraries are not being automated fast enough.

While the evidence represented in table 4 shows that interactive computer technologies are pervading every aspect of library operations, there is also evidence indicating that the librarians and the organizations in which they work may not be making a completely smooth transition to automation. The lack of a smooth transition to interactive computer applications are revealed by the results as displayed in table 5, wherein it is depicted that only 52% of the libraries have a good automation policy, only 46% are including all of their staff in their automation decisions, and only 40% are considering the question of ergonomics in the automation process. Perhaps more telling may be the data depicted in table 8, wherein only 32% of the librarians may be receiving adequate automation reeducation and retraining. Given the facts that over 96% of these librarians are using interactive computer technology now and that 74% have five or more years of interactive computer experience the correlative discrepancy between the utilization of automation and the

ideal environment for automation to operate in may be significant.

One of the most outstanding tendencies that seemed to emerge from an analysis of the data, graphically illustrated in table 11, was the lack of increased attention paid to patrons as a result of automation. From a professional perspective this kind of tendency can only have a negative impact on librarians and libraries. The question arises, can it be possible that while librarians may be turning more of their attentions to routine computer functions, direct professional contact with patrons is dwindling?

The theory, as discussed in the literature review, is that librarians now operating in an interactive computer environment are handing over tasks simplified by automation to para-professionals so that the professionals can give more attention to serving the patrons. Unfortunately, if the results from question 20 and 26 are any indication, there is evidence here to suggest that the new interactive technologies are having the diametrically opposite impact on desired services to patrons. Perhaps this tendency may be attributable to the lack of theory base reeducation and retraining as reflected in table 8, or of professionals taking the

easy path rather than becoming involved in the more difficult professional work now required of them. Whether this tendency is actually reflective of the situation in small academic libraries and not just a glitch in this survey, or a combination of these justifications, it may reveal enough to necessitate further research into this area.

What might be suggested by these results is that the small academic libraries may not fully be into the spirit of implementing the new paradigm ideals as represented in the literature review. In fact, the changes within the organizations of the small academic libraries may be lagging dangerously behind the pace of automation acquisition. This lends credence to Baker and Pastine's original contention that small academic libraries may be acquiring automation without forethought and indeed are merely following the lead of the larger academic libraries without careful consideration of situational variances, like the size and budgetary allowances of the institution.

Acceptance of technology is one thing, but when the welfare of staff and service to the patrons is neglected in the process then there is a serious problem with the integration of technology into library

organizations. Considering the extent of automation now in place in the small academic libraries (see table 4), it appears there is enough funding being made available in these institutions to permit the one time up front cost of acquiring automation. Yet, comparatively, significantly less effort is devoted toward the long term costs of providing adequate reeducation and retraining or other incentives in the way of rewards and benefits. Somehow, enough money is available to acquire the equipment, but not enough money for the personnel who are expected to implement and operate the technology at optimum design capabilities.

Technology does not change organizations; people do, but it is the librarian's perception of what technology can and will do which will eventually determine the outcome of the changes taking place in libraries now. Technological change appears to have permeated small academic libraries very fast; however, the human changes required to make the technology an adjunct to the profession rather than a liability appears to be much slower. It appears as though some librarians have been overwhelmed by technology, to the point where instead of it being the impetus for organizational changes, these librarians may be forcing technology to

work within the parameters of old values systems. The results of this ill-suited union is a whole new set of problems for small academic libraries. The transitional phase in acquiring automated systems may be fast drawing to a close while the turmoil over adjusting the libraries and librarians to automation is only just beginning.

RECOMMENDATIONS

All librarians need to continually reassess their own positions and the organization of their libraries in the face of increasing automation. More specifically, small academic librarians should be made aware of the problems of reeducation and retraining staff in the new technologies. The professional small academic librarian needs to provide at least as many resources for personnel as they apparently do for the acquisition of the automation hardware. It is support staff that should receive the benefits of planned reeducation and retraining efforts as well as the professionals. While the professionals must somehow learn to divest themselves of computerized tasks which takes them away from the patrons.

This study was not intended to be a stand-alone effort producing definitive answers. However, the study has revealed a number of areas of possible serious concern for librarians in small academic libraries who are embracing the interactive computer technologies. The final recommendation would be to charge future researchers to build upon these survey results and focus on the areas of direct professional service to patrons in a technological environment, of interactive technology reeducation and retraining, and of increasing staff participation and rewards in a growing technological environment.

APPENDIX A: QUESTIONNAIRE

January 26, 1990

Dear Librarian,

Hello! I am a graduate student in the Masters of Library Science degree program at Emporia State University in Kansas. My special interest is the small academic library. In partial fulfillment for this degree, your help in supplying data in this survey for my thesis will enhance the overall knowledge in the field for myself and hopefully for others.

The purpose of this study will be to ascertain the state of the new technologies in the small academic libraries. I hope to discover the amount of automation (interactive computerization) that is being utilized and how automation is affecting the library organizations being studied. This study is being sent to professionals and para-professionals at random in 76 small academic libraries in 13 states throughout the mountain plains region.

Previous studies of the new technologies perceived effects on libraries, librarians and patrons have not focused on the limiting factor of size of the library being researched. This study may reveal that size does make a difference in not only the perceptions of automation, but its effects on the roles of the librarians themselves in the small academic library.

A self-addressed stamped envelope is enclosed for your convenience. Please reply by February 20th. Your time and cooperation are appreciated.

David L. Pappas
School of Library and Information Management
1200 Commercial
Emporia, KS 66801

phone 316-342-5280
fax # 316-343-5997

Enc. 3

PART I (BACKGROUND)*

1. I have completed an MLS degree. (CIRCLE ONE)

YES NO

2. My position title in the library is:

(FOR THE FOLLOWING STATEMENTS, CIRCLE THE NUMBER THAT IS CLOSEST TO THE CORRECT NUMBER WITHOUT GOING OVER)

3. The number of years I have had an MLS degree is:

1 3 5 10 15 20 MORE

4. The number of years I have worked in this library is:

1 2 3 4 5 7 10 15 20 MORE

5. The number of years total I have been in library work is:

1 2 3 4 5 7 10 15 20 MORE

6. I use automated (computer interaction) equipment.

(circle one): YES NO

(IF YES, PLEASE FILL OUT THE QUESTIONS IN PART II OF THE SURVEY; IF NO, STOP HERE. THANK YOU FOR YOUR TIME AND PLEASE RETURN THE ENTIRE SURVEY.)

PART II (AUTOMATION)

7. The number of years I have used a computer terminal is:

1 2 3 4 5 7 10 15 20 MORE

8. The most recent formal (classroom instruction) automated training I have had was:

one month ago	three months ago	six months ago	one year ago
	two years ago	more	

9. The varieties of automation training I have received over the last two years and the extent of their effectiveness are: (CIRCLE ALL THE NUMBERS THAT APPLY)

	NONE	LIMITED	PARTIAL	ADEQUATE	COMPLETE
WORKSHOP:	1	2	3	4	5
FORMAL CLASSROOM:	1	2	3	4	5
ONE ON ONE:	1	2	3	4	5
SELF TAUGHT:	1	2	3	4	5

COMMENTS: _____

GENERAL QUESTIONS: (CIRCLE THE NUMBER CLOSEST TO HOW YOU FEEL ABOUT EACH OF THE FOLLOWING STATEMENTS)

STRONGLY DISAGREE..(5).....
 DISAGREE..(4).....
 NOT SURE..(3).....
 AGREE..(2).....
 STRONGLY AGREE..(1)..

- 11. I BELIEVE THIS LIBRARY HAS A GOOD COMPREHENSIVE POLICY CONCERNING AUTOMATION IMPLEMENTATION. 1 2 3 4 5
- 12. ALL LIBRARY STAFF HAVE BEEN INCLUDED IN DESIGNING AND IMPLEMENTING THE AUTOMATION POLICY. 1 2 3 4 5
- 13. I HAVE BEEN ACTIVELY INVOLVED IN THE DECISION MAKING PROCESS CONCERNING THE INCORPORATION OF AUTOMATION INTO THE LIBRARY. 1 2 3 4 5
- 14. THERE IS A WELL THOUGHT OUT PLANNED AUTOMATION TRAINING PROGRAM FOR STAFF IN THIS LIBRARY. 1 2 3 4 5
- 15. I AM SATISFIED WITH THE AUTOMATION TRAINING I HAVE RECEIVED. 1 2 3 4 5
- 16. A CONCERN FOR ERGONOMICS (STAFF COMFORT) IS INCLUDED IN THE AUTOMATION POLICY/IMPLEMENTATION PROCESS. 1 2 3 4 5
- 17. AUTOMATION HAS EXPANDED MY JOB DESCRIPTION. 1 2 3 4 5
- 18. AUTOMATION HAS INCREASED MY WORK RESPONSIBILITIES. 1 2 3 4 5
- 19. MY PAY AND/OR OTHER BENEFITS HAVE INCREASED WITH THE EXPANDED JOB DESCRIPTION THAT AUTOMATION HAS GIVEN ME. 1 2 3 4 5
- 20. AUTOMATION HAS GIVEN ME MORE TIME TO WORK DIRECTLY WITH PATRONS. 1 2 3 4 5
- 21. I BELIEVE THE LIBRARY'S MOVE TO AUTOMATION IS TOO FAST. 1 2 3 4 5
- 22. AUTOMATION HAS INCREASED THE SIZE OF THE LIBRARY STAFF. 1 2 3 4 5

23.	INTERNAL LIBRARY STAFF COOPERATION HAS INCREASED WITH THE ADVENT OF AUTOMATION.	1	2	3	4	5	90
24.	AUTOMATION HAS INCREASED PATRON USAGE OF THE LIBRARY.	1	2	3	4	5	
25.	AUTOMATION HAS INCREASED CAMPUS AWARENESS OF THE LIBRARY.	1	2	3	4	5	
26.	AUTOMATION HAS GIVEN ME MORE LATITUDE IN ADJUSTING PROCEDURES TO BETTER SERVE PATRONS.	1	2	3	4	5	
27.	AUTOMATION HAS MADE MY JOB MORE INTERESTING AND EXCITING.	1	2	3	4	5	

(over)

28. PLEASE CIRCLE THE FOLLOWING SYSTEMS IN YOUR LIBRARY THAT: 1. ARE NOT AUTOMATED; 2. ARE OFFICIALLY PLANNED TO BE AUTOMATED IN THE NEXT TWO YEARS; 3. ARE NOW IN THE PROCESS OF BEING AUTOMATED; 4. ARE PARTIALLY AUTOMATED; OR 5. ARE COMPLETELY AUTOMATED IN YOUR LIBRARY: 91

	NONE	PROCESS PLANNED	COMPLETE PARTIAL	
A. ACQUISITIONS	1	2	3	5
B. ADMINISTRATION (ie.budget)	1	2	3	5
C. CATALOGING (ie.OCLC)	1	2	3	5
D. CIRCULATION	1	2	3	5
E. SERIALS	1	2	3	5
F. NETWORK (ie.LAN)	1	2	3	5
G. INTERLIBRARY LOAN	1	2	3	5
H. BIBLIOGRAPHIC INSTRUCTION	1	2	3	5
I. ON-LINE SEARCHING	1	2	3	5
J. REFERENCE (ie.CD-ROMs)	1	2	3	5
K. CATALOG (OPAC)	1	2	3	5

29. WHO USES THE AUTOMATED SYSTEMS THAT YOU DO HAVE:
(CIRCLE ALL RESPONSES THAT APPLY) N/A = NOT APPLICABLE;
1. A SINGLE STAFF PERSON; 2. STAFF MEMBERS ONLY; 3. ALL STAFF MEMBERS AND ALL PATRONS

	INDIVIDUAL	STAFF	ALL
A. ACQUISITIONS	N/A	1	3
B. ADMINISTRATION	N/A	1	3
C. CATALOGING	N/A	1	3
D. CIRCULATION	N/A	1	3
E. SERIALS	N/A	1	3
F. NETWORK	N/A	1	3
G. INTERLIBRARY LOAN	N/A	1	3
H. LIBRARY INSTRUCTION	N/A	1	3
I. ON-LINE SEARCHING	N/A	1	3
J. REFERENCE	N/A	1	3
K. CATALOG (OPAC)	N/A	1	3

30. PLEASE INDICATE THE LEVEL OF TRAINING YOU HAVE RECEIVED FOR EACH ONE OF THESE LIBRARY FUNCTIONS THAT ARE AUTOMATED IN YOUR LIBRARY: N/A=NOT APPLICABLE;
 1=NONE; 2=VERY LITTLE; 3=TO SOME EXTENT;
 4=ADEQUATE; 5=COMPLETE.

		NONE		TO SOME EXTENT	COMPLETE	
		°		°	°	°
		°	VERY	°	ADEQUATE	°
		°	LITTLE	°	°	°
		°	°	°	°	°
A. ACQUISITIONS	N/A	1	2	3	4	5
B. ADMINISTRATION	N/A	1	2	3	4	5
C. CATALOGING	N/A	1	2	3	4	5
D. CIRCULATION	N/A	1	2	3	4	5
E. SERIALS	N/A	1	2	3	4	5
F. NETWORK	N/A	1	2	3	4	5
G. INTERLIBRARY LOAN	N/A	1	2	3	4	5
H. LIBRARY INSTRUCTION	N/A	1	2	3	4	5
I. ON-LINE SEARCHING	N/A	1	2	3	4	5
J. REFERENCE	N/A	1	2	3	4	5
K. CATALOG (OPAC)	N/A	1	2	3	4	5

31. COMMENTS: _____

(The results of this study will be anonymous and will not refer to names of people or places. However, please sign your name and address if you'd like the results of the survey.)

APPENDIX B: FREQUENCY COUNTS AND FACTOR ANALYSIS

1. Frequency count:

	<u>COUNT</u>	<u>%</u>
YES	706	84.3
NO	13	15.7
	83	

2. Factor analysis:

	<u>Count</u>	<u>%</u>
Directors	36	43.4
Non-Directors	47	56.6
	83	

3. Frequency count:

<u># OF YEARS</u>	<u>0</u>	<u>1</u>	<u>3</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>more</u>
<u>RESPONSES</u>	14	7	9	8	11	15	5	14
<u>PERCENT</u>	16.9	8.4	10.8	9.6	13.3	18.1	6.0	16.9

4. Frequency count:

<u># YEARS</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>7</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>more</u>
<u>RESPONSES</u>	1	7	9	8	11	15	5	14	10	5	9
<u>PERCENT</u>	1.2	8.4	10.8	9.6	13.3	18.1	6.0	16.9	12	6	10

5. Frequency count:

<u># YEARS</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>7</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>more</u>
<u>RESPONSES</u>	1	3	0	1	2	4	9	11	22	9	21
<u>PERCENT</u>	1.2	3.6	0	1.2	2.4	4.8	10.8	13.3	26.5	10.8	25.3

6. Frequency count:

	<u>Count</u>	<u>%</u>
YES	79	96.3
NO	3	3.7
	82	

7. Frequency count:

# YEARS	0	1	2	3	4	5	7	10	15	20	more
RESPONSE											
COUNT	4	3	3	7	4	16	17	18	9	0	21
PERCENT	4.8	3.6	3.6	8.4	4.8	19.3	20.5	21.7	10.8	0	2.4

8. Frequency count:

# MONTHS	0	1	3	6	12	24	more
RESPONSE							
COUNT	12	17	7	12	10	8	17
PERCENT	14.5	20.5	8.4	14.5	12.0	9.6	20.5

9. Frequency count:

Workshop			Formal Classroom			One-on-one			Self-taught		
#	R	%	#	R	%	#	R	%	#	R	%
0	6	7.2	0	6	7.2	0	6	7.2	0	6	7.2
1	16	19.3	1	46	55.4	1	16	19.3	1	9	10.8
2	10	12.0	2	2	2.4	2	6	7.2	2	7	8.4
3	13	15.7	3	8	9.6	3	10	12.0	3	16	19.3
4	24	28.9	4	11	13.3	4	31	37.3	4	33	39.8
5	14	16.9	5	10	12.0	5	14	16.9	5	12	14.5

#=score; R=response count; %=percent

Factor Analysis:

	<u>Count</u>	<u>%</u>
Adequate	27	32
Inadequate	56	67
	83	

11. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	17	20.5
2	26	31.3
3	9	10.8
4	17	20.5
5	12	14.5
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
Agree	42	51.9
Disagree	39	48.1
	81	

12. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	11	13.3
2	27	32.5
3	7	8.4
4	22	26.5
5	14	16.9
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
Agree	37	45.7
Disagree	44	54.3
	81	

13. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	43	51.8
2	22	26.5
3	2	2.4
4	6	7.2
5	8	9.6
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
<u>Agree</u>	64	79.0
<u>Disagree</u>	17	21.0
	81	

14. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	9	10.8
2	23	27.7
3	19	22.9
4	18	21.7
5	9	10.8
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
<u>Agree</u>	30	37.0
<u>Disagree</u>	51	63.0
	81	

15. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	13	15.7
2	36	43.4
3	14	16.9
4	10	12.0
5	7	8.4
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
<u>Agree</u>	48	59.3
<u>Disagree</u>	33	40.7
	81	

16. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	9	10.8
2	24	28.9
3	17	20.5
4	18	21.7
5	13	15.7
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
<u>Agree</u>	32	39.5
<u>Disagree</u>	49	60.5
	81	

17. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	42	50.6
2	22	26.5
3	2	2.4
4	5	6.0
5	10	12.0
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
<u>Agree</u>	61	75.3
<u>Disagree</u>	20	24.7
	81	

18. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	45	54.2
2	22	25.3
3	5	6.0
4	3	3.6
5	7	8.4
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
Agree	65	80.2
Disagree	16	19.8
	81	

19. Frequency count:

#	<u>Count</u>	<u>%</u>
0	2	2.4
1	6	7.2
2	6	7.2
3	7	8.4
4	28	33.7
5	34	41.0
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
Agree	11	13.6
Disagree	70	86.4
	81	

20. Frequency count:

#	<u>Count</u>	<u>%</u>
0	2	2.4
1	4	4.8
2	10	12.0
3	18	21.7
4	27	32.5
5	22	26.5
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
Agree	13	16.0
Disagree	68	84.0
	81	

21. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	4	4.8
2	4	4.8
3	9	10.8
4	34	41.0
5	30	36.1
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
Agree	6	7.4
Disagree	75	92.6
	81	

22. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	2	2.4
2	8	9.6
3	3	3.6
4	21	25.3
5	47	56.6
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
Agree	9	11.1
Disagree	72	88.9
	81	

23. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	7	8.4
2	27	32.5
3	29	34.9
4	9	10.8
5	9	10.8
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
<u>Agree</u>	33	40.7
<u>Disagree</u>	48	59.3
	81	

24. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	19	22.9
2	27	32.5
3	24	28.9
4	5	6.0
5	6	7.2
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
<u>Agree</u>	46	56.8
<u>Disagree</u>	35	43.2
	81	

25. Frequency count:

<u>#</u>	<u>Count</u>	<u>%</u>
0	2	2.4
1	25	30.1
2	29	34.9
3	22	26.5
4	0	0.0
5	5	6.0
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
<u>Agree</u>	52	64.2
<u>Disagree</u>	29	35.8
	81	

26. Frequency count:

#	<u>Count</u>	<u>%</u>
0	2	2.4
1	11	13.3
2	23	27.7
3	29	34.9
4	9	10.8
5	9	10.8
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
Agree	33	40.7
Disagree	48	59.3
	81	

27. Frequency count:

#	<u>Count</u>	<u>%</u>
0	2	2.4
1	27	32.5
2	35	42.2
3	6	7.2
4	9	10.8
5	4	4.8
	83	

Factor Analysis:

	<u>Count</u>	<u>%</u>
Agree	61	75.3
Disagree	20	24.7
	81	

28. Frequency count:

ACQUISITIONS		
	<u>Count</u>	<u>%</u>
0	2	2.4
NONE	18	21.7
PLANNED	20	24.1
PROCESS	4	4.8
PARTIAL	29	34.9
COMPLETE	10	12.0

ADMINISTRATION		
	<u>Count</u>	<u>%</u>
0	3	4.0
NONE	26	31.3
PLANNED	13	15.7
PROCESS	6	7.2
PARTIAL	27	32.5
COMPLETE	8	9.6

CATALOGING

	<u>Count</u>	<u>%</u>
0	2	2.4
NONE	2	2.4
PLANNED	1	1.2
PROCESS	3	3.6
PARTIAL	15	18.1
COMPLETE	60	72.3

CIRCULATION

	<u>Count</u>	<u>%</u>
0	2	2.4
NONE	12	14.5
PLANNED	21	25.3
PROCESS	10	12.0
PARTIAL	10	12.0
COMPLETE	28	33.7

SERIALS

	<u>Count</u>	<u>%</u>
0	2	2.4
NONE	23	27.7
PLANNED	27	32.5
PROCESS	5	6.0
PARTIAL	13	15.7
COMPLETE	13	15.7

NETWORKS

	<u>Count</u>	<u>%</u>
0	5	6.0
NONE	25	30.1
PLANNED	17	20.5
PROCESS	7	8.4
PARTIAL	11	13.3
COMPLETE	18	21.7

INTER-LIBRARY LOAN

	<u>Count</u>	<u>%</u>
0	2	2.4
NONE	3	3.6
PLANNED	3	3.6
PROCESS	3	3.6
PARTIAL	23	27.7
COMPLETE	49	59.0

LIBRARY INSTRUCTION

	<u>Count</u>	<u>%</u>
0	2	2.4
NONE	53	63.9
PLANNED	10	12.0
PROCESS	2	2.4
PARTIAL	14	16.9
COMPLETE	2	2.4

ON-LINE

	<u>Count</u>	<u>%</u>
0	4	4.8
NONE	10	12.0
PLANNED	6	7.2
PROCESS	2	2.4
PARTIAL	16	19.3
COMPLETE	45	54.2

REFERENCE

	<u>Count</u>	<u>%</u>
0	2	2.4
NONE	17	20.5
PLANNED	8	9.6
PROCESS	4	4.8
PARTIAL	41	49.4
COMPLETE	11	13.3

PUBLIC ACCESS CATALOG

	<u>Count</u>	<u>%</u>
0	2	2.4
NONE	20	24.1
PLANNED	17	20.5
PROCESS	4	4.8
PARTIAL	9	10.8
COMPLETE	31	37.3

Factor analysis:

	<u>COUNT</u>	<u>%</u>
<u>EMBRACED</u>	<u>51</u>	<u>61.4</u>
<u>NOT EMBRACED</u>	<u>32</u>	<u>38.6</u>
	83	

29. Frequency count:

ACQUISITIONS		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>35</u>	<u>42.2</u>
<u>INDIVIDUAL</u>	<u>23</u>	<u>27.7</u>
<u>STAFF</u>	<u>23</u>	<u>27.7</u>
<u>ALL</u>	<u>2</u>	<u>2.4</u>

ADMINISTRATION		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>38</u>	<u>45.8</u>
<u>INDIVIDUAL</u>	<u>23</u>	<u>27.7</u>
<u>STAFF</u>	<u>21</u>	<u>25.3</u>
<u>ALL</u>	<u>1</u>	<u>1.2</u>

CATALOGING		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>5</u>	<u>6.0</u>
<u>INDIVIDUAL</u>	<u>16</u>	<u>19.3</u>
<u>STAFF</u>	<u>59</u>	<u>71.1</u>
<u>ALL</u>	<u>3</u>	<u>3.6</u>

CIRCULATION		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>36</u>	<u>43.3</u>
<u>INDIVIDUAL</u>	<u>2</u>	<u>2.4</u>
<u>STAFF</u>	<u>34</u>	<u>41.0</u>
<u>ALL</u>	<u>11</u>	<u>13.3</u>

SERIALS		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>50</u>	<u>60.3</u>
<u>INDIVIDUAL</u>	<u>7</u>	<u>8.4</u>
<u>STAFF</u>	<u>23</u>	<u>27.7</u>
<u>ALL</u>	<u>3</u>	<u>3.6</u>

NETWORKS		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>44</u>	<u>53.0</u>
<u>INDIVIDUAL</u>	<u>4</u>	<u>4.8</u>
<u>STAFF</u>	<u>19</u>	<u>22.9</u>
<u>ALL</u>	<u>16</u>	<u>19.3</u>

INTER-LIBRARY LOAN		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>6</u>	<u>7.2</u>
<u>INDIVIDUAL</u>	<u>15</u>	<u>18.1</u>
<u>STAFF</u>	<u>59</u>	<u>71.1</u>
<u>ALL</u>	<u>3</u>	<u>3.6</u>

LIBRARY INSTRUCTION		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>61</u>	<u>73.6</u>
<u>INDIVIDUAL</u>	<u>3</u>	<u>3.6</u>
<u>STAFF</u>	<u>9</u>	<u>10.8</u>
<u>ALL</u>	<u>10</u>	<u>12.0</u>

ON-LINE		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>15</u>	<u>18.0</u>
<u>INDIVIDUAL</u>	<u>17</u>	<u>20.5</u>
<u>STAFF</u>	<u>38</u>	<u>45.8</u>
<u>ALL</u>	<u>13</u>	<u>15.7</u>

REFERENCE		
	<u>Count</u>	<u>%</u>
<u>N/A</u>	<u>31</u>	<u>37.4</u>
<u>INDIVIDUAL</u>	<u>2</u>	<u>2.4</u>
<u>STAFF</u>	<u>10</u>	<u>12.0</u>
<u>ALL</u>	<u>40</u>	<u>48.2</u>

PUBLIC ACCESS CATALOG

	<u>Count</u>	<u>%</u>
N/A	41	49.4
INDIVIDUAL	3	3.6
STAFF	3	3.6
ALL	36	43.4

30. Frequency count:

ACQUISITIONS

	<u>Count</u>	<u>%</u>
N/A	45	54.2
NONE	18	21.7
VERY LITTLE	5	6.0
TO SOME EXTENT	8	9.6
ADEQUATE	4	4.8
COMPLETE	3	3.6

ADMINISTRATION

	<u>Count</u>	<u>%</u>
N/A	43	51.8
NONE	15	18.1
VERY LITTLE	11	13.3
TO SOME EXTENT	6	7.2
ADEQUATE	7	8.4
COMPLETE	1	1.2

CATALOGING

	<u>Count</u>	<u>%</u>
N/A	9	10.8
NONE	7	8.4
VERY LITTLE	11	13.3
TO SOME EXTENT	15	18.1
ADEQUATE	22	26.5
COMPLETE	19	22.9

CIRCULATION

	<u>Count</u>	<u>%</u>
N/A	31	37.3
NONE	6	7.2
VERY LITTLE	7	8.4
TO SOME EXTENT	17	20.5
ADEQUATE	13	15.7
COMPLETE	9	10.8

SERIALS

	<u>Count</u>	<u>%</u>
N/A	53	63.9
NONE	7	8.4
VERY LITTLE	7	8.4
TO SOME EXTENT	6	7.2
ADEQUATE	5	6.0
COMPLETE	5	6.0

NETWORKS

	<u>Count</u>	<u>%</u>
N/A	42	50.6
NONE	4	4.8
VERY LITTLE	6	7.2
TO SOME EXTENT	10	12.0
ADEQUATE	13	15.7
COMPLETE	8	9.6

INTER-LIBRARY LOAN

	<u>Count</u>	<u>%</u>
N/A	14	16.9
NONE	14	16.9
VERY LITTLE	11	13.3
TO SOME EXTENT	6	7.2
ADEQUATE	20	24.1
COMPLETE	17	20.5

LIBRARY INSTRUCTION

	<u>Count</u>	<u>%</u>
N/A	56	67.5
NONE	8	9.6
VERY LITTLE	1	1.2
TO SOME EXTENT	5	6.0
ADEQUATE	8	9.6
COMPLETE	5	6.0

ON-LINE			REFERENCE				
	<u>Count</u>	<u>%</u>		<u>Count</u>	<u>%</u>		
	<u>N/A</u>	<u>19</u>	<u>22.9</u>		<u>N/A</u>	<u>29</u>	<u>34.9</u>
	<u>NONE</u>	<u>8</u>	<u>9.6</u>		<u>NONE</u>	<u>5</u>	<u>6.0</u>
	<u>VERY LITTLE</u>	<u>6</u>	<u>7.2</u>		<u>VERY LITTLE</u>	<u>10</u>	<u>12.0</u>
<u>TO SOME EXTENT</u>	<u>11</u>	<u>13.3</u>		<u>TO SOME EXTENT</u>	<u>6</u>	<u>7.2</u>	
	<u>ADEQUATE</u>	<u>23</u>	<u>27.7</u>		<u>ADEQUATE</u>	<u>15</u>	<u>18.1</u>
	<u>COMPLETE</u>	<u>16</u>	<u>19.3</u>		<u>COMPLETE</u>	<u>18</u>	<u>21.7</u>

PUBLIC ACCESS CATALOG

	<u>Count</u>	<u>%</u>	
	<u>N/A</u>	<u>40</u>	<u>48.2</u>
	<u>NONE</u>	<u>3</u>	<u>3.6</u>
	<u>VERY LITTLE</u>	<u>3</u>	<u>3.6</u>
<u>TO SOME EXTENT</u>	<u>4</u>	<u>4.8</u>	
	<u>ADEQUATE</u>	<u>8</u>	<u>9.6</u>
	<u>COMPLETE</u>	<u>25</u>	<u>30.1</u>

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