DOCUMENT RESUME

ED 326 238 IR 053 336

AUTHOR Kester, Diane Katherine Davies
TITLE Modeling the School System Adoption Process for Library Networking.
PUB DATE 90
NOTE 215p.; Ph.D. Dissertation, East Carolina University.
PUB TYPE Dissertations/Theses - Doctoral Dissertations (041) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC09 Plus Postage.
DESCRIPTORS Decision Making; Elementary Secondary Education; Information Networks; *Learning Resources Centers; Library Cooperation; *Library Networks; Library Planning; *Library Services; Library Surveys; *Models; Questionnaires; School Libraries; *Shared Resources and Services; *Telecommunications; User Needs (Information)

ABSTRACT

The successful inclusion of school library media centers in fully articulated networks involves considerable planning and organization for technological change. In this study a preliminary model of the stages of school system participation in library networks was developed with the major activities for each stage identified. The model follows stages from the innovation adoption and diffusion literature, and is constructed from a study of the literature, observation, and informal interviews. The model is composed of four primary aspects: technological support, financial support, human support, and anticipated activities and applications. Within each aspect, anticipated events in each of the three stages of participation in a network were identified. The population for the study included school systems in one or more of three types of networks: OCLC vendors, state regional multitype networks, and statewide school networks. A random sample of 674 school districts in 17 states with 3,613 school systems was drawn, and a questionnaire based on the preliminary stage model was mailed to district level persons responsible for school media programs, school contact persons for the library network, superintendents, or building school library media specialists. Descriptive statistics were used to provide a profile of the respondents and chi-square and gamma coefficient tests were performed on each event in the questionnaire in relation to the level of involvement reported by the respondent. Significance of the 19 events tested in the model varied when analyzed by the different variables. This model provides a guide for users to assess their own progress in the adoption of innovations and to plan for the future. Twenty-six tables, 11 figures, the survey instrument, and a 175-item bibliography are provided. (Author/SD)

MODELING THE SCHOOL SYSTEM ADOPTION PROCESS FOR LIBRARY NETWORKING

by

Diane Katherine Davies Kester

DIANE KATHERINE DAVIES KESTER. Modeling the School System Adoption Process for Library Networking (Under the direction of Evelyn H. Daniel.)

ABSTRACT

The successful inclusion of school library media centers in fully articulated networks involves considerable planning and organization for technological change. No model to assist school systems in the decision-adoption process previously existed in the literature. In this study a preliminary model of the stages of school system participation in library networks was developed with the major activities for each stage identified. The model follows stages from the innovation adoption and diffusion literature and is constructed from the study of the literature, observation, and informal interviews. The model is composed of four primary aspects: technological support, financial support, human support, and activities and applications. Within each aspect, anticipated events in each of the three stages of participation in a network were identified.

The population for the study included school systems in one or more of three types of networks: OCLC vendors, state regional multitype networks, and state-wide school networks. A random sample of 674 school systems in 17 states with 3,613 school systems was drawn. A questionnaire based on the preliminary stage model was mailed to district level persons responsible for school media programs, school

contact persons for the library network, superintendents, or building school library media specialists.

Descriptive statistics were used to provide a profile of the respondents by state, type of network, position of respondent, size of school district, school type, and level of involvement. Profiles by the reported level of involvement in a network were done by state and size of the school district. Chi-square and gamma coefficient tests were performed on each event in the questionnaire in relation to the level of involvement reported by the respondent.

Sixteen of the nineteen events tested in the model were significant. However, when analyzed by type of network (school vs OCLC), only 11 events were significant; and when analyzed by position of the respondent, size of the school system, and years in a network, very few events were significant.

As do other models, this one provides a guide for users to assess their own progress in the adoption of innovations and to plan for the future.

ACKNOWLEDGEMENTS

It is with deep appreciation and love that I acknowledge my family, my colleagues, and my friends who have understood my key word, "focus." In addition, I wish to express special appreciation to Evelyn Daniel for her words of enccuragement throughout the process of this study.

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Chapter 1. INTRODUCTION AND PROBLEM

Introduction

A basic principle of American librarianship is that each individual has the right of equal opportunity for access to information to meet his or her needs. Application of this principle in schools is important since over one-fifth of the population in the United States is of school age or is employed in a school. (U.S. Department of Commerce, 1989, pp. 13, 128,138) Ninety-three percent of all schools have library media centers that serve 97.6% of pupils in public schools. (U.S. Department of Education [U.S. DOE], 1987, p. B-1) Seventy-two percent of the total number of libraries in the United States are in schools. (Bowker, 1986, p. 381; U.S. DOE, 1987) The question of how to provide all the students in these schools with equal access to information is an important problem.

Individual school library media centers have limited resources. They are small and lack budgeted support; however, through technology, access to resources beyond the boundaries of the school building can be provided. These additional resources include materials from public, academic, and special libraries as well as from information

database vendors. Although cooperation among libraries has been accepted for many years, schools have more recently become active in library networks and cooperative organizations (hereafter referred to in aggregate as networks). Today the following scenario could be true in only a limited number of high schools.

> Scene: A high school junior begins work on an assigned research paper. Her school library lacks the resources she needs. What might she do?
>
> Using traditional printed indexes, she could select terms to use for an online search of bibliographic databases. The abstract of an article retrieved online might answer one of her questions and lead her to download that citation and others in order to check her school's periodical holdings to locate the original article. Some of the articles might not be available at her school library. She might then check the CD-ROM catalog of the holdings of the school, public, academic, and special libraries that participate in the multitype library organization her school belongs to for the periodicals she needs.
>
> Books and journal articles might be requested electronically from participating libraries using the computerized interlibrary loan module. The next day some of the articles might have been received via the telefacsimile machine. The books might arrive through other delivery systems by the end of the week. The student now has the resources to tackle her assignment.

To make the atypical scenario more the norm, one needs to study how schools can become part of library networks. Questions to be addressed in this study include: Are there

identifiable, predictable, and necessary factors that must be in place before a school district can become a participating member of a library network? Is the sequence predictable? Does the decision process of network membership follow the diffusion of innovation pattern? Are there patterns of activities that enable schools to participate in networks? Are the patterns similar for different network structures? What innovative practices are adopted by the libraries of the school systems who are members of library networks? What services and/or programs of the networks are used by school systems?

These are some questions that need to be explored in order to understand how school systems adopt membership in multitype library organizations. The goal of this study is the development of a model that describes the process. This model could serve, first, as a guide to understanding the process by which school systems participate in networks, and second, as a pattern for other school systems in the exploratory stage of adoption of network participation.

General Description of the Area of Concern

A description of the explosion of information and the importance to society of access to information was placed firmly before the public by John Naisbitt in his best seller, *Megatrends*. In speaking of knowledge he states:

> It can be created, it can be destroyed, and most importantly it is synergetic - that is, the whole is usually greater than the sum of the parts ... The new source of power is information in the hands of many. (Naisbitt, 1984, p.7.)

Children grow up with many needs for information. In a school, it is to be hoped that one of the main sources of information is the school library media center. A comprehensive school library program offers a variety of materials and services to support the school's curriculum. Obviously, no one library can contain all the materials needed to support exploration and research investigations of all of the students who are being actively encouraged to expand their knowledge base and to acquire the intellectual tools needed to flourish in today's information-based society.

Because resources are limited in most school library media centers, students either must restrict their information searching or go to other libraries or sources of information for the material they need. Historically, cooperation between school libraries and other types of libraries has been limited. While individual students have used public libraries to meet informational needs, they have usually not found academic libraries receptive to their use. Recently, school library media centers have become a part of library networks, recognizing that individual collections

cannot be large enough to meet the needs of all the teachers and students and that information services accessed through electronic means are vital to a strong library media program. (American Association of School Librarians [AASL], 1988, pp. 69-84)

Terms used in study

For the purpose of this study a **library network** is defined as a formal organization of independent and autonomous libraries working together for their mutual benefit. The arrangement may include one or more types of libraries (i.e., academic, public, school, and special).

The terms **school district** or **school system** refer to the local educational administrative unit with a superintendent as the chief administrator. The building level person responsible for the **school library media program** is referred to at various times in the development of school media programs as the school librarian, school library media specialist, or media specialist.

Information sources housed within a school media center are **internal holdings**; and information accessed from outside the building are **external information access points**. (Miller and Moran, 1987)

School library development

School and public library cooperation is coming full circle. The school libraries in early America were often called "common school libraries" and served the community. Lack of organization, financial support, and management of the collection, led to the disappearance of these common libraries. (Greenman, 1913; Hall, 1915; Certain, 1915; Vought, 1923; Fargo, 1939; Cecil, 1940; Batchelder, 1953; Martin, 1959; Aldrich, 1959; Rossoff, 1971)

At the turn of the century, schools looked to the public library for the loan of collections. Schools increased in size and demands for curriculum-related materials could not be met by public library budgets. Classroom collections were formed from a variety of sources. Duplicate and poorly selected titles characterized many of the collections. Gradually, these collections were pooled to form the nucleus for a school library. A teacher was often assigned part-time duty as overseer of the collection. Led by New York and Massachusetts in 1835 and Michigan in 1837, a few states passed legislation to allow local taxes to be used in support of a school library and librarian. (Cecil and Heaps, 1971)

The formation of the Department of Libraries in the National Education Association [NEA] (1896) and the

development of standards of regional accrediting agencies provided leadership in the development of school library programs. In 1920, a joint committee of NEA and the North Central Association of Colleges and Secondary Schools, chaired by C. C. Certain, published *Standard Library Organization and Equipment for Secondary Schools of Different Sizes.* (North Central Association of Colleges and Secondary Schools, 1920) This document stimulated development of school library service, particularly after the standards were adopted by regional accrediting agencies. Five years later a joint committee from NEA and the American Library Association, again chaired by C. C. Certain, published *Elementary School Library Standards*, providing guidelines for elementary school library programs.

In rural areas, schools continued to look to the public library for meeting the recreational reading needs of students. Sometimes state laws encouraged such cooperation. (Rossoff, 1971) In more populous communities, high school librarians were hired to develop the library into one which would serve as a resource to support the curriculum of the school as well as to provide recreational reading materials for students. (Hall, 1915)

The impact of high school research assignments on public libraries became strained. In 1959, Martin reflected that

public library and school library relationships had been growing apart for 25 years. (Martin, 1959, p.112) The 1945 publication by ALA of *School Libraries for Today and Tomorrow: Functions and Standards*, chaired by Mary Peacock Douglas, recognized the differences in school library and public library services. The 1960 *Standards for School Library Programs* encouraged school board support of school library programs. The integrated media programs in these standards emphasized the use of audiovisual materials and the teaching role of the school librarian. Federal monies became available to schools for equipment and materials, particularly for science and math. Expensive items such as 16mm motion picture films were purchased by the school system and maintained centrally for all teachers to share.

The 1969 *Standards for School Media Programs*, again under the chairmanship of Frances Henne, recommended commercial or centralized book processing, an attempt to shift responsibilities for technical services from the building level to the district level. Advocating a unified audio-visual/school library program, these standards encouraged cooperation and consideration of the impact of new technologies and the emergence of information retrieval systems.

The Association of Educational Communications and Technology joined with the Association of School Librarians to develop *Media Programs: District and School* which was published in 1975. The integration of the media program into the total school and district instructional program was emphasized.

In response to the changing educational needs, *Information Power: Guidelines for School Library Media Programs* was written and published jointly by AASL and AECT in 1988. Emphasis in *Information Power* is on (1) physical and intellectual access to information and (2) partnerships with students, parents, and other educational professionals, including other librarians. Both areas of emphasis include the use of resources outside the school - networking.

The development of school libraries has been influenced by many changes in society's demands on public education: political policies, curriculum and educational theories, state and national standards, guidelines of regional accrediting agencies, and educational materials and technologies. School library service continues to grow as libraries network, sharing materials and programs.

Library cooperation

The concept of library networks has evo' 'ed since the late 1800's. Although many events and ideas influenced the

development of networks, two factors have been identified as fundamental. First, the profession recognized that even large research libraries could not be self-sufficient. Second, advances in technology and particularly the use of computers made it possible to handle repetitive tasks and to store information more easily.

In the late 1960's the Library of Congress decided to produce machine readable tapes of cataloging data in addition to printed cards and established a new standard, one for electronically stored information. This standard (MARC format) enabled groups of libraries to work cooperatively to form bibliographic utilities and automated catalog systems and, in retrospect, was of major significance in the establishment of library networks. The Library of Congress did not expand services to support library cooperation and groups of libraries assumed the leadership.

Network Structures

Six network organizational structures have been identified that have school library members: OCLC regional agency; Western Library Network (WLN); state networks; state regional cooperatives; state school cooperatives; and local multitype library organizations.

OCLC. One group, composed of academic libraries in Ohio, formed the Ohio College Library Center (OCLC) in 1967. Six New England land-grant universities joined to form the New England Library Information Network (NELINET). NELINET elected to avoid duplication of OCLC efforts and, as other regions eventually did also, contracted with OCLC to utilize the cataloging subsystem. Thus, regional networks emerged to provide access to OCLC; however, their role within the regions and within the structure of OCLC was not, and perhaps still is not, fully defined. (Stevens, 1980a, pp. 34-36)

Several regional organizations provide a link to OCLC through training, hardware evaluation, and consultants. SOLINET is a regional network with members in ten southeastern states.

> The mission of SOLINET is to facilitate resource sharing (whether automated or not) through distributed processing, linkages, and tiered responsibilities in order to help SOLINET members improve quality and economy of service. (Manning, Segal, and Walbridge, 1984, p. 101)

Other regional networks provide OCLC services. These networks and the regions served are AMIGOS (southwest), CAPCON (the Washington, DC. area), NELINET (New England states), PACNET (the Pacific west), and SOLINET (southeast). Some state networks have elected to serve as brokers of OCLC services. Among these are ILLINET (Illinois), InCoLSA

(Indiana), Michigan Library Consortium, MINITEX (Minnesota), Missouri Library Network Corporation, SUNY/New York, and Wisconsin Library Consortium.

Among the services of OCLC are catalog card production, online catalogs, interlibrary loans, online acquisition, name authority file, CD-ROM products, and a directory of libraries, publishers, and vendors.

WLN. A regional network that has included schools is the Western Library Network, WLN (originally Washington Library Network). Established in the 1970s, WLN was founded to serve the libraries of Washington and surrounding states. Shared cataloging, catalog maintenance, acquisitions, and interlibrary loan are among the services of WLN. In 1987 the database was stored on a CD-ROM and sold as Laser-Cat. In addition to libraries in Washington, libraries in Alaska, Arizona, Idaho, Montana, and Oregon are members.

State and Regional Cooperation

LSCA. Federal support for libraries, beginning with the Library Services Act (LSA) in 1956, provided federal support for establishing public libraries in rural areas. LSA was amended through the years; in 1964 it became the Library Services and Construction Act. Title III of the act provided money for interlibrary cooperation. (*Library Services and Construction Act*, 1964) This legislation

appropriated money to the states for planning and developing interlibrary cooperation. Directed at the state level, the legislation allowed development of diverse projects. Public, special, and school libraries became involved with academic libraries in LSCA projects. By 1983, almost $75,000,000 had been appropriated over 17 years.

Little involvement of school libraries in formal networks had occurred at the time the report of the Task Force on the Role of the School Library Media Program in the National Program was issued in 1978. This report encouraged school library participation in library networks to meet the information needs of young people and extolled the potential contributions of school libraries in multitype library networks.

Networking activity increased in school libraries in 1986 and 1987. Trezza reported in 1987 that Delaware had two schools among the 25 public, 11 academic, and 10 special libraries which had developed a computerized catalog of 602,700 titles and 2.4 million holdings published on microfiche. Florida had started formal plans for the Florida Library Network which included schools. By the end of 1986, ILLINET included 2,261 libraries of which 851 were schools. Michigan expanded the public library cooperatives and today the networks include schools. In Minnesota,

"possibly the largest union catalog of school library holdings" (Trezza, 1987), was being created in a project of 59 Minnesota school districts with 450 libraries and 250,000 titles. The union catalog in Montana, MONCAT, is distributed to school libraries. In New Hampshire 27 high school libraries are included in the Automated Information System (AIS). Librarians in Pennsylvania elected to publish their own CD-ROM union catalog database with 1.4 million records for 98 libraries, including school libraries. This state project includes telefacsimile networks and cooperative delivery services. (Trezza, 1987)

Figure 1.1 has been constructed from information obtained in publications by Martin (1986) and Wareham (1986), and from information collected for this study. Martin focused particularly on networks that use automation as the major tool for providing services. She surveyed 24 networks. Wareham surveyed the administrator of each state library. By integrating these two sources and collecting additional data, a master list of networks with schools as members was compiled for this study. Letters were then sent to these networks requesting school membership lists.

FIGURE 1.1

SCHOOL MEMBERSHIP IN LIBRARY NETWORKS

	Multitype Organizations 1986 (Wareham)	Multitype Organizations With Schools (Wareham)	Number of Schools or Districts (Wareham)	Districts Reported by Martin	Districts Identified in this Study
AL	2	2	15	3	3
CA	8	8	16	4	40
CO	9	8	203	6	173
CT	8	6	400		139
FL	5	1	67		67
GA	6	1	1		0
ID	3	2	8	2	1
IL		17	913	3	557
IN	10	10	275	18	267
KS	7	5	94		113
KY	6	3	21		14
ME		1	100		N/R
MD	3	3	20		20
MI	18	12	1371	10	61
MN	10	6	344		318
MO	9	7	82		80
MT	4	1	16	5	16
NE	6	6	766	1	108
NH	1	1	110		60
NJ	12	2	33		24
NY	12	8	48		664
NC	2	2	8	2	4
OH	14	9	65		33
OK	3	2	8		3
OR	4	1	20	5,1	30
PA	12	4	55	2	48
RI	3	1	48		48
SC	8	1	2		1
SD	3	1	25		1
TN	3	1	3		
TX	10	1	3	1,1	1
VT	3	1	229		71
VA	9		10		1
WA	5	4	11	3,1	7
WI	13	13			62
	231	150	4390	111	3037

(Chart constructed from statistics in Wareham, 1986; Martin, 1986; and from information collected for this study)

The definition of a library network has changed as technology and the cooperative concepts have developed. In 1978 a library network was defined by the National Commission on Libraries and Information Science (NCLIS) as:

> Two or more libraries and/or other organizations engaged in a common pattern of information exchange, through communications, for some functional purpose. (NCLIS, 1978, p.89)

The commission report goes on to specify a formal arrangement to provide materials, information, and services for patrons. The use of computers and electronic communications was indicated as a method of interaction.

Other descriptions specify cooperative programs involving one or more projects, formal or informal, such as union lists and catalogs, coordinated collection development, group purchasing plans, and interlibrary loans. A restrictive definition is given by Stevens. He says a library network is a library organization that is:

> supported primarily by payment for services from participating libraries; directed by a full-time staff; controlled by an independent government body with a high level of involvement (generally through a board of directors from participating libraries); built around a cooperatively maintained bibliographic database in machine-readable form; linked online by a telecommunications system. (Stevens, 1980b, p.405)

Stevens' definition may hold true for academic with academic, and public with academic library cooperatives; however, school with school and school with public libraries have historically participated in informal agreements. In 1978, the National Commission on Libraries and Information Science stated in *The Role of the School of the School Library Media Program in Networking*:

> Even though these activities have taken place for some years, there is little published information on the involvement of school library media programs in networking. (NCLIS, 1978, p. 8)

Research on the overlap of collections in school libraries compared with collections in public libraries has been conducted by Altman (1972) and Doll (1984, 1985). School library and public library cooperative activities were studied by Roethe (1980) and Estes (1980). A study to identify union catalogs in school systems was done by Lutz (1983).

Research on schools and networking has been done by Immroth (1980), Turock (1981), Walker (1982), and Weeks (1982), and more recently by Lunardi (1987) and Partridge (1988). Statistics published by the Association of Specialized and Cooperative Library Agencies (ASCLA) biennially for ten years are "the only source available that provides broad coverage of current library cooperative

activities in the United States" (Wareham, 1986). The ASCLA report, using information submitted by chief officers of state library agencies, lists cooperatives and networks within each state giving the number of libraries of each type within each cooperative entity.

Since 1977, Martin has periodically written about existing networks and issues in networking. Her focus is "cooperation that uses automation as the major tool for improving the services of the cooperation" (Martin, 1986, p.1).

Additional statistics are reported by Lunardi (1987) in his study of school participation in networks that developed as a result of the Library Services and Construction Act. Using 1980 statistics, he identified 4,434 school libraries within 241 networks in 40 states. (Lunardi, 1987, p. 38) In contrast, the 1986 ASCLA report lists 5,204 schools in 151 networks in 34 states. Individual schools or school districts were not identified.

Statement of the Problem

The formation of single type and multitype library organizations began over 30 years ago. Twenty-five years have passed since the Library Services and Construction Act first provided seed money to establish interlibrary organizations in the states. Networking is no longer an

innovation for academic libraries. With the common purpose of providing information to patrons, school and public libraries are in varying stages of this process. Given the sparseness of research literature and the strong social need for school libraries to bond with other libraries, investigation of the process that school systems and school libraries follow in becoming a part of inter-library cooperatives and networks is timely.

Justification

This study employs the theory of diffusion of innovations and the model of innovation. "The innovation process consists of a usual sequence of five stages, each characterized by a particular range of events, actions, and decisions made at that point" (Rogers, 1983, p. 362). Several researchers have suggested that an organization goes through a diffusion process in accepting and utilizing some new technique or technology. (Rogers and Agarwala-Rogers, 1976; Havelock et al, 1969; Pelz, 1983) This study uses a model to describe the process that school libraries as parts of school systems follow in becoming active members of library networking organizations.

Diffusion studies have proved helpful in understanding such diverse activities as planting hybrid corn, cattle

breeding, use of contraceptives, interest in solar energy, use of educational television, and acceptance of new food products, the areas of social and organizational change, and the area of technological innovations. (See Beal, et al, 1957; Copp, 1956; Eichholz, 1961; Eveland, et al, 1977; Farnsworth, 1940, among others.) The successful inclusion of the school library media center in a fully articulated network involves considerable planning and organization for technological change. A preliminary model of stages of school system participation in library networks has been developed with the major activities for each stage identified. The model follows the stages in the innovation adoption and diffusion literature and was constructed from the study of the literature, observation, and informal interviews. The model is composed of four primary aspects: technological support, financial support, human support, and activities and applications. Within each aspect, anticipated events in each of three stages of participation in a network were identified. This study attempts to verify the model by collecting data from a wide variety of school systems in three types of network organizations. The data concentrates on technological, financial, and human support and networking activities.

Assumptions

1. It is assumed that there are predictable and consistent patterns in the stages that different school systems go through as their libraries join library networks.

2. It is assumed that different types of library networks have similar patterns.

3. It is assumed that someone will be designated by the school system to be responsible for the school system's libraries as the contact person for this study.

4. It is assumed that the school systems in library networks will be in varying stages of network participation.

Limitations

1. The current statistics reported in the literature may be unreliable, as they are based on reports from a single source in each state or network. The researcher must rely on these statistics, and will do so cautiously.

2. The current literature does not distinguish between schools and school systems in network membership enumeration.

Delimitations

1. School systems in this study will refer to public school systems.

2. The school systems selected for this study will

belong to at least one library network, that may be one of three types: either a vendor of OCLC services, a state regional multitype library cooperative, or a state school library cooperative.

3. The school systems will have one or more individual school libraries that are directly involved in the network.

4. This study will not involve a quantitative or qualitative measurement of public school library cooperation in library networks.

The Study

The stages and characteristics at each stage of network participation that school systems follow have been tentatively identified. The school district will be the unit of analysis. Variables include: (1) composition of the single or multitype library organization; (2) use of technology in the library media center; (3) library networking funding; (4) activities of the library and education professionals; (5) local and state library organization efforts; and (6) activities and applications of networking.

External factors include community attitudes towards cooperative efforts; city, county, and/or state legislative actions, and leadership in library cooperative programs at the local and state levels.

Organization of the Study

Chapter 2 contains a review of related literature with emphasis on cooperative endeavors in school library programs. Research studying the diffusion of innovation process is also reviewed with emphasis on innovations in education and in library services.

Chapter 3 contains the research methodology, including the research question, a preliminary model, the population and the sample. The mail survey instruments for school districts is provided in Appendix A.

Chapter 4 describes the findings of the study based on the questionnaires. Data are reported by type of network, size of school system, person responding to the questionnaire, years in a network, and by phase in the model.

Chapter 5 discusses the findings and reexamines the tentative model of the change process, making adjustments as necessary. Recommendations and suggestions for further research are included.

The Appendices include the cover letter, survey instrument, identification of library networks and school systems used in this study, and complete statistical tables that are summarized in Chapter 4.

Chapter 2. REVIEW OF RELATED LITERATURE

Theoretical Base

The theoretical base for this study rests on the literature on diffusion of innovation studies, innovations in education, and innovations in library and information science. The concept of a library network is considered an innovation for this study. As defined by Rogers, an "innovation" is "an idea, practice, or object perceived as new by an individual" (Rogers & Shoemaker, 1971, p. 19). "Diffusion" is the process by which innovations spread to the members of a social system. (Rogers & Shoemaker, 1971, p. 12)

The study of the diffusion of innovations had its beginnings in France in 1903 as a judge studied the trends and spread of new ideas. In the United States, diffusion of innovations study began with a classic work of Ryan and Gross who investigated adoption of the use of hybrid corn by Iowa farmers. (Ryan and Gross, 1943) Their report established a prototype methodology for a diffusion investigation.

Rogers Innovation-Decision Model

Everett M. Rogers first synthesized the research on diffusion of innovations in 1962. After gathering information on 405 publications about diffusion of innovations, he published his theoretical framework and model of diffusion. (Rogers, 1962) This model was modified in his second book, co-authored with Shoemaker and published in 1971. (Rogers and Shoemaker, 1971) By then the literature included 1,200 empirical studies, 300 bibliographies, and other nonempirical publications. In the book's third edition, the model was revised based on a study of over 2,200 diffusion reports. (Rogers, 1983)

The innovation-decision process as defined by Rogers is:

> the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision. (Rogers, 1983, p. 163)

As can be seen in this definition, Rogers has identified five stages that an individual or group passes through when evaluating a new idea and deciding whether to adopt it. Rogers' stages are described below.

Stage One - Knowledge

"Knowledge occurs when an individual (or other decision-making unit) is exposed to the innovation's existence and gains some understanding of how it functions" (Rogers,

1983, p. 164). The types of knowledge identified by Rogers include "software information," "how-to knowledge," and "principles knowledge." The first type, software information, is gathered from informal conversations and readings as the individual or group begins to discover what the innovation is and how it works. This leads to discovering how to use the innovation. As interest continues, the individual or group investigates underlying principles of the innovation in order to gain a firm understanding of it.

Stage Two - Persuasion

At this stage the individual or group forms a favorable or unfavorable attitude toward the innovation. Rogers identifies the individual or group at this stage as "more psychologically involved" and places significance on where the individual or group seeks information, what messages it receives, and how it interprets the information. (Rogers, 1983, p. 179)

Stage Three - Decision

"The decision stage in the innovation-decision process occurs when an individual (or other decision-making unit) engages in activities that lead to a choice to adopt or reject the innovation" (Rogers, 1983, p. 172). At this stage the innovation may be adopted or rejected.

Stage Four - Implementation

"Implementation occurs when an individual (or other decision-making unit) puts an innovation into use" (Rogers, 1983, p. 174). At this point the innovation-decision process changes from a mental to an action process. Rogers points out that organizations are more likely to encounter problems at this stage than individuals due to the number of individuals involved with different views of the situation.

Stage Five - Confirmation

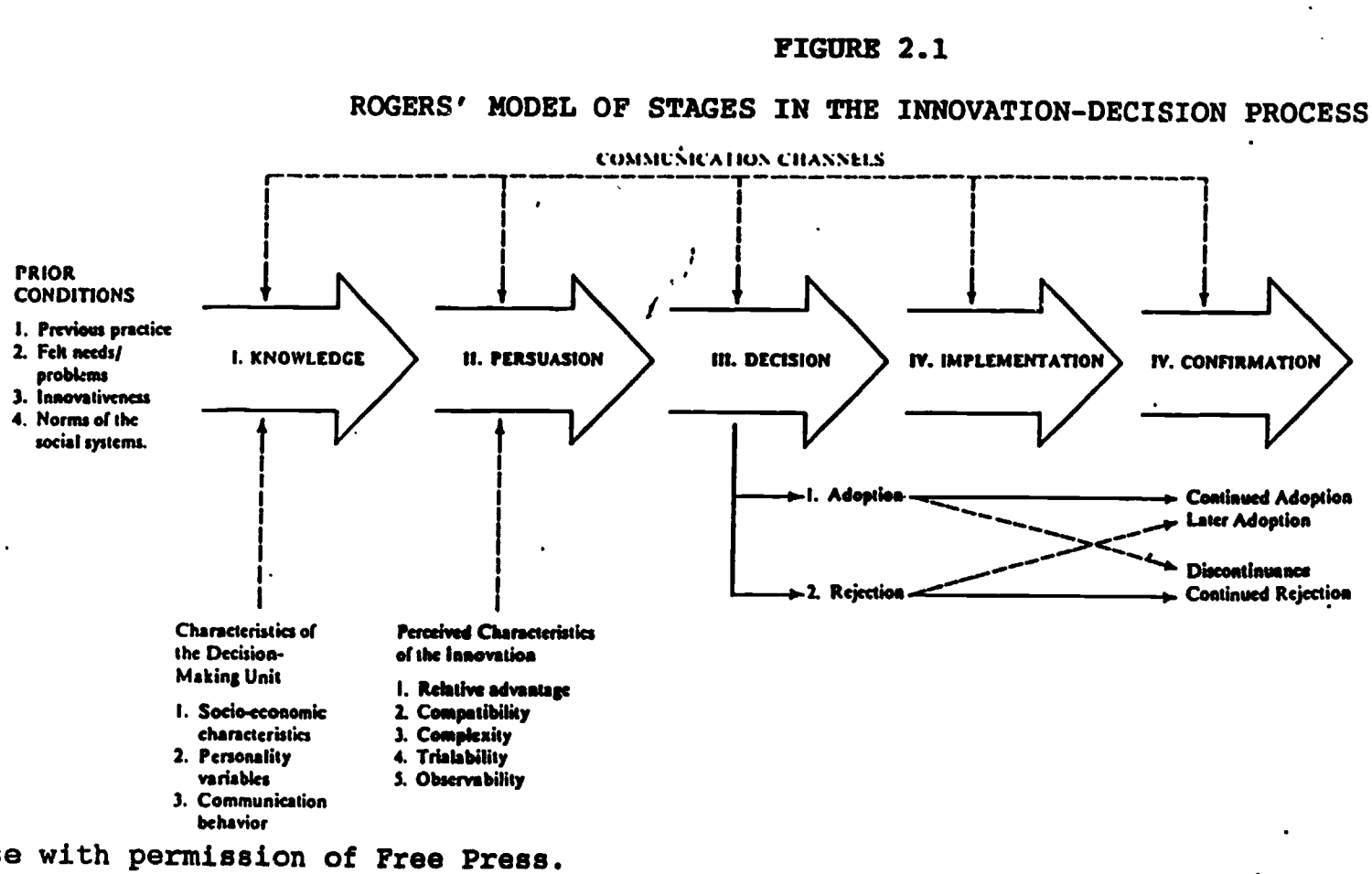
"At the confirmation stage the individual (or other decision-making unit) seeks reinforcement for the innovation decision already made, but he or she may reverse this decision if exposed to conflicting messages about the innovation" (Rogers, 1983, p. 184). This stage continues as the individual or group continues to support the innovation. (Figure 2.1)

Other Models

Although Rogers' model is the most widely known, Witte (1972) and Pelz (1985) attribute the first description of the phases of a decision process to John Dewey in 1910. Pelz provides a historical review of the literature and cites management literature that treats the stages, steps, or phases of decision processes. The phase model of Brim, Glass, Lavin & Goodman (1972) divides the decision process

FIGURE 2.1

ROGERS' MODEL OF STAGES IN THE INNOVATION-DECISION PROCESS



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(Rogers, 1983, p. 165)

into six stages: (1) the identification of the problem, (2) gathering information, (3) identification of possible solutions, (4) evaluation of the solutions, (5) selection of a strategy for performance, and (6) action or implementation. Stages or lists have also been formulated by Mintzberg, Raisinghani, and Theorel (1976); Rogers and Shoemaker (1971: 100-104); Havelock (1969: Chapter 10) (1973: 13-15, 113-114); Zaltman, Duncan, and Holbek (1973): 588-70); Lambright (1979: 6-8), and Eveland, Rogers, and Klepper (1977), among others.

A major empirical study of the decision process using an innovation stage model as its basis was undertaken at the Research Institute for Decision and Organization of the University of Munich and reported by Witte. (1972) Witte analyzed the data collected from 283 cases of an innovation in industries in West Germany and tested the data against the Brim-Glass-Lavin-Goodman version of the phase theorem. He concluded that "complex and innovative decision-making processes have a constant relationship between the activities of 'information gathering,' 'development of alternatives,' 'evaluation of alternatives,' and 'choices' over the total time period" rather than as sequential steps. (Witte, 1972, p. 179-80)

Beal, Rogers and Bohlen (1957), rural sociologists,

identified five stages that all of their 148 subjects passed through. These were awareness, information gathering, application, trial, and adoption. They concluded that their field interview study supports "the validity of the stages concept" (p. 163).

Yin (1979) conducted case studies on six innovations. He identified three stages: (1) Improvisation, (2) Expansion, and (3) Disappearance. Yin recognized that acceptance of an innovation is a process and described this process with passages and cycles. The Expansion stage included several critical passages and cycles. The following types of events are often found in the Expansion stage:

1. Increases in the number and scope of applications involving the innovation
2. Equipment turnover and updating (cycle)
3. Transition from external to internal funding and budgetary support for the innovation (passage)
4. Formal changes in the organization identify the innovation (passage)
5. Development of stable arrangements for the maintenance and supplies needed by the innovation (passage)
6. Initiation of internal personnel classifications or certification procedures to cover the new specializations associated with the innovation (passage)

(Yin, 1979, p.63)

The disappearance stage occurs when the innovation has become routinized and is no longer an innovation to the organization.

Yin's examples of passages and cycles of organizational change in the adoption process are illustrated in Figure 2.2.

Pelz (1985) coded over 2000 "episodes" in his study of innovations and concluded that, "For simple innovations that are copied with little change - like many in the literature on innovation diffusion - the succession of stages will be moderately clear" (Pelz, 1985, p. 264).

Diffusion of Innovations in Education Research

Rogers identified six major traditions in diffusion of innovation research: anthropology, early sociology, rural sociology, education, industrial, and medical sociology. Each tradition has been established by researchers who have built their studies on previous research within their respective fields. The literature on innovation theory is extensive. However the education field has lagged in establishing models. Educational institutions are often criticized for their reluctance and slow adoption of new organizational patterns, methods, and technology. (Ross, 1958; Mort and Cornell, 1941; Mort and Pierce, 1947; Rogers,

FIGURE 2.2

ORGANIZATIONAL PASSAGES AND CYCLES

RELATED TO ROUTINIZATION

Type of Resource or Operation	Passages	Cycles
Budget	Innovation support changes from soft to hard money	Survives annual budget cycles
Personnel		
Jobs	Functions became part of job descriptions or prerequisites	
Incumbent turnover		Survives introduction of new personnel
		Survives promotion of key personnel
Training		
Prepractice	Skills become part of professional standards, professional school curriculum	
Inservice		Skills taught during many training cycles
Organizational governance	Establishment of appropriate organizational status	Attainment of widespread use
	Use of innovation becomes part of statute, regulation, manual, etc.	
Supply and maintenance	Supply and maintenance provided by agency or on long-term (contract) basis	Survives equipment turnover

(Yin, 1979, p.63)

1962; Rogers and Shoemaker, 1972). Educational research is most closely linked to the subject of interest here.

Some of the first analyses of the diffusion of innovations in education were undertaken at Teachers College, Columbia University under the direction of Paul Mort and reported by him in a series of articles and monographs published from 1938 through 1960. Many of these studies were dissertations. The typical methodology involved data gathering through questionnaires sent to principals and superintendents. The school system was the unit of analysis in these studies. The studies supported and validated the stage theory.

The Horace Mann - Lincoln Institute of School Experimentation held a seminar in 1960, bringing together educators to discuss case studies of innovation. The papers of those fifteen sessions were edited by Miles in *Innovation in Education*, (1964). In the concluding chapter, Miles formulates several generalizations from the writings of the participants concerning educational systems, characteristics of the innovation, innovative persons and groups, conditions of the community and educational systems, and the planning and execution of the change process. Several observations may be drawn from these areas that may relate to the adoption of networking by school systems. Although they may

appear to be common sense, they are fundamental to the change process.

> Innovations requiring inordinate outlays of money, energy, or time by the adopting person or group are likely to move slowly. (p. 635)
>
> Although technological innovations are relatively easy to adopt, they are equally easy to reject or discontinue. (p. 636)
>
> Innovations which are difficult to operate ...will diffuse relatively slowly. (p. 637)
>
> There appears to be an interdependence of the innovators and others in the community. Administrators, as authority figures, are crucial in introducing innovations. (p. 641)
>
> Group support for individual innovators will influence the successful acceptance of an innovation. Sometimes it is necessary to create a different innovative structure to circumvent the negative influence of a target system. (p. 643)
>
> Forces exist for systems to maintain the status quo. However, factors such as the growth in size of a system and a search for alternatives to solve problems increase interest in innovations. (p. 644)
>
> The installation of an innovation in a system is not a mechanical process, but a developmental one, in which both the innovation and the accepting system are altered. (p. 647)

Drawing upon Rogers (1962), Miles uses four stages in analyzing the diffusion of innovations in education: design, awareness-interest, evaluation, and trial. (Miles, 1964, p. 19) From these, he has developed a typology of change strategies, a sequence of specified activities, through

which a school system moves to adopt an innovation successfully. Initiation and strategies for change may come from one of four systems: 1) the target system using existing structure, 2) the target system using new structure, 3) systems in the environment using existing structure, or 4) systems in the environment using new structure. A target system is the school district, a college, or a university. Systems in the environment include school boards, state departments of education, or educational organizations. (Figure 2.3)

FIGURE 2.3

A TYPOLOGY OF CHANGE STRATEGIES

STAGES IN THE STRATEGY PRIOR TO ADOPTION BY TARGET SYSTEM					
Initiator of Strategy		Design of Innovation	Local awareness-interest	Local evaluation	Local trial
Target system (school, college, etc.)	Existing structure				
	New structure				
Systems in environment of target system	Existing structure				
	New structure				

(Miles, 1964, p. 21)

In creating this matrix of change strategies, Miles identified four stages in the adoption of an educational innovation. The same four stages are evident no matter which group initiates the change, the school system or an outside organization.

Drawing from the papers delivered in the seminar, Miles documented the optimal conditions at each stage - design, awareness-interest, evaluation, and trial. In cases of technological innovations "much design-relevant communication must occur among technical experts before the innovation can be ... diffused" (Miles, 1964, pp. 650-51). Journals, papers, and conferences are considered crucial to the communication process.

In the awareness-interest stage, it is important that the innovation is perceived as important by people and organizations within as well as outside the school system environment. During the evaluation stage potential adopters must be given the opportunity to visit and observe the operation of the innovation by others, according to Miles.

The evaluation stage is important, not only for administrators and supervisors, but also for building level educators. This may be especially true for school library media specialists and library media supervisors who are

progressing through the adoption process of technological innovations in library service.

Miles concluded that "during the early period of an innovation's use, there seems much importance in supplying support and help to users" (Miles, 1964, p. 653). Training and supporting materials along with human contact and encouragement are necessary for the success of the innovation.

Although Miles did not identify the aftermath in his definition of the four stages of change, he does discuss the fate of innovations. He speculates that education does not provide enough thorough evaluation of innovative projects. "Most educational decisions appear to be made in a intuitive, prudential manner" and not based on research. (Miles, 1964, p. 658) Evaluation of intellectual growth and educational effectiveness is difficult.

A framework for analyzing the <u>individual</u> innovation user was devised by Hall, Loucks, Rutherford, and Newlove of the Research and Development Center for Teacher Education (Hall, Loucks, Rutherford, and Newlove, 1975). An interesting variable they term **Levels of Use (LoU)** is defined as:

> distinct states that represent observably different types of behavior and patterns of innovation use as

> exhibited by individuals and groups. These levels characterize a user's development in acquiring new skills and varying use of the innovation. Each level encompasses a range of behaviors, but is limited by a set of identifiable Decision Points. (Hall, Loucks, Rutherford, and Newlove, 1975)

The levels, approximately equivalent to stages, are illustrated in Figure 2.4. The factors used to describe each level include knowledge, acquiring information, sharing, assessing, planning, status reporting, and performing. (Hall, Loucks, Rutherford, and Newlove, 1975, pp. 54-55)

Following up on their framework, Loucks interviewed 45 teachers and identified the behavioral indicators at each of six **Levels of Use**. Levels of Use are intended to serve as a diagnostic tool for planning and facilitating the change process of individuals.

FIGURE 2.4

Loucks' Levels of Use Model

Levels of Use of the Innovation: Behavioral Indicators	
Level of Use	**Behavioral Indices of Level**
VI Renewal	The user is seeking more effective alternatives to the established use of the innovation.
V Integration	The user is making deliberate efforts to coordinate with others in using the innovation.
IVB Refinement	The user is making changes to increase outcomes.
IVA Routine	The user is making few or no changes and has an established pattern of use.
III Mechanical Use	The user is using the innovation in a poorly coordinated manner and is making user-oriented changes.
II Preparation	The user is preparing to use the innovation.
I Orientation	The user is seeking out information about the innovation.
0 Nonuse	No action is being taken with respect to the innovation.

(Hall, Loucks, Rutherford, and Newlove, 1975, p. 4)

In a non-empirical report, Cory wrote on the innovation of the use of microcomputers in the instructional program of schools. Drawing on personal observations, she reflected on the confusion and concern of educators about this new technology. To help teachers and administrators address their concerns, she adopted a four stage model of "full implementation of computers for instruction." Cory identified six factors to be monitored at each stage and developed criteria to determine the point at which the adoption had moved to the next stage. These factors are: hardware, software, staff development, computer-assisted learning, computer literacy, and attitude. Her stages are somewhat whimsically named:

Stage I - Stage of Getting on the Bandwagon

Stage II - Stage of Confusion

Stage III - Stage of Pulling It All Together

Stage IV - Stage of Full Implementation

Factors affecting the speed of transition from one stage to the next were also identified. (Cory, 1983)

Although Cory did not identify other diffusion of innovation models, her stages coincide with Rogers' implementation stage. In her model of this particular innovation, action took precedence over the mental process. Administrators were so eager to implement computers in their

schools that the preliminary stages of adoption were often skimmed through. Decisions were being made without planning and without goals having being developed with teachers. As a result of Cory's model, teachers were able to visualize the process of adoption of this innovation and to adjust their change strategies for successful adoption. The lesson here may be the observation that with exuberance about an innovation early stages may be skipped.

Huberman and Miles studied twelve innovation projects in education. (Huberman and Miles, 1984) Data were collected from interviews, surveys, observations, and documents (notes, announcements). The researchers devised a list of codes to categorize and sort events and statements in their field notes. Elements of the innovation-decision process that were reported included introduction-awareness, motives, attitudes, assistance during adoption.

Although stages were not identified, Huberman and Miles did identify six factors that contributed to successful early use of an innovation or innovative practice. They seem to follow the sequential pattern of stages and are:

1. Relative degree of preparedness of the participants. (Understanding of the innovation, commitment to the project, access to resources and materials, personal skills and training, in-service training, and building level support contribute to the successful adoption of an innovation.)

2. Users volunteered rather than pressured.

3. The suitability of the innovation in the actual classroom or organization.

4. Actual degree of practice change.

5. Latitude for making changes.

6. Size and scope of the innovation.
(Huberman and Miles, 1984)

Their research questions explored the process of adoption and utilization innovation. The Huberman and Miles model describes the school improvement process with predictors and outcomes. This model provides school administrators with a guide to planning and implementing change.

In another non-empirical study, Gray (1986) developed a model for the integration of microcomputers in teacher education programs. Expanding on the Cory model, he included early stages of exploring and investigation of the innovation. His model is illustrated in Figure 2.5.

FIGURE 2.5

FOUR-STAGE MODEL FOR INTEGRATION OF MICROCOMPUTERS IN TEACHER EDUCATION

Stages	Hardware	Software	Staff Development	CAI/CMI
1st. Initiation "The Beginning"	Few micros packages Possibly a lab for student use	Few BASIC literacy Limited software library	Introductory wkshop "Bits & bytes- RAM and ROM"	Very sparse use Some experimenting by motivated faculty
2nd. Confusion "Stressful"	Some additional "floaters" Considering new systems	Aiding CAI and some utilities Primary use of a limited library	Examining application programs Finding some activities stressful	Beginning to apply software to basic curriculum Still apprehensive
3rd. Application "Insight"	Increased use Some micros in offices	Added more advanced packages; utilities, and CAI	Advanced training sessions, i.e., data base searching, teaching	Introductory use of CAI & CMI. Specific learning activities are designed
4th. Integration "Full Steam Ahead"	Ready access to micros in in labs & faculty offices	Wide variety is available; CAI & utilities	Short courses Individual sessions Orientation for new faculty	Majority of faculty using micros for CAI, CMI, and database searching

(Gray, 1986, p. 29)

As with other models, this one provided a guide for users to assess their own progress in adoption of an innovation and to plan for positive action. It is apparent that no one event marks passage from stage to stage, but there is a gradual process as knowledge and use of the innovation grow.

Diffusion of Innovations in Library and Information Science

A comprehensive study of the diffusion of innovations in library and information science using surveys, interviews and case studies was done for the Office of Educational Research and Improvement, Department of Education, by King Research, Inc. (Griffiths, Havelock, and Sweets, 1986) The report reviewed the history of adoption of innovations in public, academic, and special libraries with emphasis on innovations during the 1970s and 1980s.

The model developed in this report was based on Rogers' Five Stage Model of the Diffusion of Innovation: knowledge, persuasion, decision, implementation, and confirmation; however, the Griffiths-Havelock-Sweets model (hereafter referred to the Griffiths model) was of the diffusion and utilization of innovation in libraries. In addition to examining the steps that were necessary for adoption of an innovation, they also studied the library mission, the

degree of acceptance or resistance of the innovation, and the norms for the type of library.

The Griffiths model focuses on three input variables: (1) the characteristics of libraries and librarians, (2) the characteristics of the social networks within which libraries and librarians operate, and (3) the characteristics of innovations. They identified output variables affected by these inputs to be: "problems in the adoption process, adoption, rejection, adaptation/ integration, outcomes of adoption, and continuance or discontinuance" (Griffiths, Havelock, and Sweets, 1986, p. 19).

Both organizational and individual characteristics were considered. Characteristics of libraries as innovation adopters included the following: structure/hierarchy, finances and budgets, technical patterns of power distribution, expectations placed on libraries that might inhibit innovation, and expectations placed on libraries that might facilitate innovation. Characteristics of librarians as innovators or innovation adopters included their view of their own role and the role of the library, education and training, and prominent/typical personality traits which might affect innovation adoption.

The second input variable, characteristics of the social network of libraries included: libraries as participants in networks, major membership organizations and associations, important meetings, national leadership, role of the government, role of the private sector, major library research and development institutions, major print media in the library field, professional schools, specialized mechanisms, and to link them, the professional societies and associations.

Characteristics of innovations in the library field related to the application of computing and telecommunications technologies comprised the third variable group. Three categories were identified for grouping of innovations: input/storage innovations (such as automated acquisitions and serials control, bibliographic utilities, multitype library networking, and automated cataloging), output/service innovations (online catalog, online searching, and automated circulation); and management innovations (integrated library systems and computer usage for management).

After analyzing the results of the case studies, the Griffiths model was refined. Key components of the refined model of diffusion and utilization of innovation include:

a. As inputs to the adoption decision
   * Awareness of the innovation
   * Interest in the innovation and perception of its relevance to the adopting organization
   * Leadership perception of lag (or the adoption/ utilization gap)
   * Inside leadership support
   * Vendor subsidization programs
   * Availability of slack resources

b. As inputs to the implementation phase
   * Decision to adopt/try an innovation
   * Staff attitudes
   * Leadership commitments
   * Inside innovation champion
   * Staff involvement in decision and planning for implementation

c. As inputs to an ongoing utilization of the innovation
   * Technical problems in the pilot/trial implementation phase
   * Improved product availability
   * Realized, visible benefits and potential for longer term accrual of benefits
   * Continued leadership commitment

d. As inputs to secondary diffusion process
   * Inside innovation champion
   * Pilot/trial implementation phase
   * Library media
   * Possibility of adoption by other sites
   * Networking activities

(Griffiths, Havelock, and Sweets, 1986, p. 51)

One example in each of the library application innovation groups was selected for in-depth study. These were bibliographic utilities, online searching, and output performance measures. Fifty-four case studies of the adoption and use of innovations in eighteen academic, special, and public libraries were analyzed. The

researchers presented 82 hypotheses in 11 clusters which are intended to assist in understanding the diffusion and utilization of innovation process in libraries. These clusters are formed around characteristics of the innovation, the library, the librarian, the vendors of the innovative product or service, the adoption process, and the level of use. Again, both organizations and individuals were the unit of analysis. The innovation adoption process cluster draws heavily from Rogers.

The flow chart model created during this study is cluttered and difficult to follow. Possibly, the researchers attempted to include too much for one study. The 82 hypotheses were never successfully confirmed. The report concludes with a recommendation of a national diffusion network which would serve as a clearinghouse for information about recent innovations and libraries which are adopting them. The clearinghouse would be a primary contact for libraries in the early stages of interest and fact finding. The proposal is detailed but no action has since been reported on the development of a national network for diffusion of library and information innovations.

It is interesting to note that this report, funded by the Department of Education, made few references to school libraries. Instead, a rather sweeping statement was made in

justifying why school libraries were not included in the study, that they had not "demonstrated a critical mass of adoption" (Griffiths, Havelock, and Sweets, 1986, p. 87). Griffiths stated, "We have additional data [on innovation implementation processes in libraries] and insights from studies of K-12 libraries, which are quite different from the others" (Griffiths, Havelock, and Sweets, 1986, p. 207). A search for the source of this "additional data" was made. Neither King Research nor the subcontractor, Network, Inc., could identify the source or sources leading to this conclusion.

Later, discussing the design of a diffusion network, they wrote:

> School librarians are often professionally and organizationally isolated from full participation in the library and information science fields. Their awareness and capacity are less well-developed overall than those of the other categories of librarian. (Griffiths, Havelock, and Sweets, 1986, p. 208)

School Library Cooperation

Studies on school cooperation with multitype libraries received little attention until the 1980s. Preliminary to her survey in New York, Weeks (1982) observed that,

> Information available on the topic is primarily philosophical or descriptive in nature, appearing in professional journal articles and conference papers

> geared toward the school library professional audience. Few evaluative studies have appeared in the literature. (Weeks, 1982, p. 4)

Although that still holds true, schools have not been totally ignored in library networks and organizations. One of the earliest studies on library cooperation identified barriers to library cooperation. Examining the concept of sharing library resources, Nolting (1969) categorized barriers in five areas: (1) psychological, (2) informational, (3) traditional and historical, (4) physical and geographical, and (5) legal and administrative. Nolting concluded that "most of the barriers identified as obstacles are not real. Many are based on false assumptions, some are excuses, and still others are arguments for cooperation" (Nolting, 1969, p. 10).

Hamilton and Ernest (1977) compiled a series of articles on the ideas and aspirations of library cooperation. The chapter on school library participation was written by Falsone (1977), then assistant commissioner of education of the State Library of Colorado. She discussed limitations and strengths of school libraries and their potential contributions in multitype library organizations. Falsone concluded with a history of school members of the multitype

regional library systems in Colorado. Focus in that state has been on the contributions, not the barriers, of school library participation in multitype library organizations. The school libraries in Colorado appear to have progressed through the phases of adoption, as reported by Falsone.

A landmark report was issued in 1978 by the Task Force on the Role of the School Library Media Program in the National Program. This Task Force was appointed by the National Commission on Libraries and Information Science (NCLIS) and charged with the responsibility of examining the framework of networking and the potential role for the school library media programs. The report covered the rationale for inclusion of school library media programs, their potential contributions to a national network, barriers that inhibit their cooperation, benefits to their users, and recommendations regarding their participation.

Four general principles or guidelines regarding library cooperation were set forth. These concepts will appear in the model being developed in this study.

1. Each individual has a right to equal opportunity of access to information that meets his/her needs.

2. Networks must be built on strong individual library collections. Each participating library must have the capability of serving the ordinary needs of its users and of contributing to the network as well as receiving services.

3. Networking is not free. Besides specific equipment and materials costs, staff time will be needed to plan the network, to carry out its vital operations, and to provide the shared services.

4. All participating libraries must be equitably represented on the governing board of the network.

5. Effective communication among members is essential. A good modern communication system should link all member libraries, and individual librarians must feel at ease in contacting and working with their counterparts in other libraries.

(National Commission on Library and Information Science, 1978, p. 35)

Preliminary to her survey study of the role of school library media programs in multitype library networks, Immroth (1980) used the conclusions of articles by Nolting, Swank, Casey, and Montgomery. Nolting (1969) discussed barriers to networking libraries, these barriers were repeated in the Task Force on the Role of the School Library Media Program in the National Program. Swank (1970), Casey (1971), and Montgomery (1977) continued discussion on sharing of resources. Immroth's study involved a survey of school media specialists in public school districts of the state of Colorado. The school districts were users or potential users of the multitype library system in that state.

From the Nolting, Swank, Casey, and Montgomery reports, Immroth created a matrix of network characteristics and compared them to the NCLIS Task Force Report. The characteristics of a network Immroth used included: (1) information resources; (2) readers or users; (3) schemes for organization of data; (4) methods of delivery of resources; (5) formal organization; and (6) bidirectional communication. The Task Force principles were shown to overlap with the characteristics in her matrix.

Immroth concluded that there had been success in overcoming some of the inhibiting barriers to library cooperation and that this demonstrated the ability of a multitype library network to include schools successfully. The reasons given were: (1) strong leadership at the state library level had led to the inclusion of school library media programs as equal members of the network; (2) professional isolation had decreased; (3) users usually received materials fast enough to satisfy their needs; and, (4) distance did not deter libraries from exchanging materials.

Another study of school participation in a state network was done by Sheldon (1981). She surveyed the Illinois Interlibrary Cooperation Program consultants to gather information on school library participation in ILLINET, a

vendor of OCLC services. Only 17% of the school libraries had become members compared to 94% of the academic libraries and 64% of the special libraries. Lack of participation was attributed to several factors including the restrictive representation on the governing board and fear that school library members would 'take over' the network. Consultants of the state's interlibrary cooperation program expressed concern that school librarians were working in isolation from other librarians and were members of separate library organizations. Sheldon concluded that school librarians may be unaware of the possibilities of resource sharing with other types of libraries. If so, those school librarians had not yet reached the first stage in the adoption process. It is to be hoped that the situation has shifted within the eight years since that study and that the study itself may have encouraged many of the school libraries to move into the decision-adoption process. Again, the need to identify the process is supported.

Roethe (1980) and Estes (1980) investigated cooperative services to children in North Carolina. Almost 80% of the public librarians reported cooperative services and over 80% of the school librarians reported some cooperative activities. Both groups rated better library services to children as the primary reason for cooperation. Over 97% of

each group favored library cooperation. (Roethe, 1980; Estes, 1980)

In a conference paper, White (1980) reported on a study of existing networks. Local, state, regional, and national networks were providing a variety of services including: technical services, acquisitions/collection development, circulation, reference and bibliographic searching, serials control, interlibrary loan, delivery services, storage and preservation, resource sharing, publicity, and continuing education. School involvemer" was not mentioned; however, schools were members of some of the networks identified in the study.

In a case study of the Rochester [New York] Area Resource Exchange, Turock (1981) collected and analyzed data on three factors: performance, organization, and attitude. She drew three conclusions: (1) the perceptions of multitype network success are highly related to those of funding, communication, and delivery, (2) legislation is an important influencing factor on librarians, and (3) funding disagreements need to be resolved for both compensation mechanisms and continued commitment. Two of these three conclusions concern the funding for resource sharing activities.

Turock predicted that the greatest increase in activity (borrowing) will be experienced by the school libraries themselves as they join multitype cooperatives and that librarian media specialists will need to plan for the change in workload. (Turock, 1981, p. 157)

An examination of the patterns of interlibrary borrowing of the Howard County, Maryland public school system's use of the Maryland Interlibrary Organization was performed by Walker (1982). The study was limited to one aspect of networking, interlibrary loan, and described the user, the school level, and subject areas of the requests.

During the third year of state funded pilot projects of regional school library systems in New York, Weeks (1982) undertook a study of the attitudes of participants in a multitype library network, participants in a single type library network, and non-network participants. New York has a tradition of library services and resource sharing. The state legislature authorized the establishment and support of systems of public libraries and of reference and research libraries. In 1978 it began support of the regional school library systems through pilot projects. Weeks studied the relationship between attitudes to library networking and the personal factors of years of experience, level of education, type of school assignment, degree of involvement in

professional organizations, and participation in continuing education opportunities. Using the results from the analysis of a questionnaire, she drew four major conclusions.

1. Most school library media specialists in New York State have generally positive attitudes toward the concept of library networking, although those individuals participating in the multitype library network pilot projects indicated the most positive reactions toward the concept.

2. The four network services that were considered by respondents to be most important for the school library media programs were currently available in the library pilot projects in the state. (These services included interlibrary loan, delivery systems, reference services, and development of union catalogs.)

3. School library media specialists indicated that they held generally positive attitudes toward technology and participation in a network did not appear to influence these attitudes.

4. The correlation between the two sets of attitudes did not indicate a great deal of overlap between the two concepts.

(Weeks, 1982, pp. 175-177)

Contributions of schools to networks. Studies to support the assertion that resources in school libraries can contribute to library networks have been done by Altman (1972), Greenberg (1981) and Doll (1983, 1984, 1985). Altman, in her study of the overlap of collections in 31 secondary schools in New Jersey, reported the diversity of

high school collections. The study examined over 6,000 titles for 12 research topics frequently used by high school students. Nearly two-thirds of the titles were unique to an individual library, illustrating the capacity of secondary school library to support interlibrary loans. (Altman, April 1972)

In the Greenberg study, collections of thirteen school libraries were examined for evidences of overlap or duplication of holdings. She found little. Schools demonstrating high availability of books and materials were found to be users of interlibrary loan services This has also been the case for academic and public libraries as net borrower/lender studies have shown.

The more recent studies of Doll again support the value of school libraries in multitype library cooperatives. Analysis of the overlap in collections of school and public libraries was reported by Doll (Spring 1983, July 1984, Spring 1985). She reported no evidence to support the belief that school library collections or public library collections exclusively serve both the informational and recreational needs of elementary school students. Collection development policies differ between the two types of libraries allowing school libraries to develop unique collections. The need of the current study to investigate

the process of how school systems become active network members is again confirmed.

Benefits of networking. Positive changes have transpired as a result of school media programs becoming involved in networking. Sorensen (1984) identified nine categories that have been affected.

1. Professional attitude (less isolated from other professionals)
2. Staff deployment (shift of responsibilities when participating in networking)
3. Facilities and equipment (minimal changes other than addition of microfilm readers, microcomputers, and telephone)
4. Financial considerations (fears of losses from interlibrary loans replaced by confidence that materials can be replaced)
5. Collection development (received more attention with cooperative collection development)
6. Technical services (shift to centralized technical processing)
7. Library skills instruction (expanded to include use of external holdings)
8. User attitude (improved with student use of electronic reference sources)
9. Relationships with users (administrators and teachers working more closely with school library media specialist to meet the needs of students)

Sorensen concluded that there was a trend toward more school library media participation in networks. The

attitude of sharing with other libraries and providing access to information would continue, he believed, and that more emphasis would be placed on service to the one seeking information rather than on the technology. (Sorensen, 1984, pp. 441-442)

Following up on the use of technology, Immroth reviewed the literature on library automation and networking. She concludes that the "majority of school library programs have been slow to automate functions" (Immroth, 1984).

For school library media participation in networks to increase, school media specialists and other network participants need to understand more fully the processes involved with how school libraries enter and become fully participating members of networks. This study proposes to examine the stages involved in this process.

After a four year effort to promote cooperation among school library media specialists and public librarians, the Connecticut State Library and the Connecticut State Department of Education identified six levels of cooperation. (Figure 2.6) As reported by Billman and Owens (1985), these levels are similar to phases in the adoption processes beginning with no involvement or cooperation in Level I and progressing through informal cooperation, formal communication, formal cooperation, resource sharing and

climaxing with formal planning at Level VI. Characteristics of activities of school and public libraries at each level were identified. The model was constructed from the observations of a library media consultant in the Connecticut State Department of Education and the director of the Division of Library Development of the State Library.

Chapman (1985) studied the attitudes of public librarians and school media specialists in a large metropolitan city in North Carolina through a survey. Both groups agreed that there were many benefits from networking; however, a significantly higher proportion of public librarians than media specialists expressed a willingness to participate in interlibrary cooperation.

Avenues into networks. It appears that libraries have entered into cooperatives primarily from one of two avenues: LSCA Title III or OCLC. Title III of the Library Services and Construction Act (LSCA) provides states with money to be used for multitype library cooperation. The Online Computer Library Center (OCLC) provides an online union catalog, the world's largest database of library bibliographic information, along with interlibrary loan.

FIGURE 2.6

CONNECTICUT MODEL OF HIERARCHY OF COOPERATION

	Level I No Involvement or Cooperation	Level II Informal Cooperation	Level III Formal Communication	Level IV Formal Cooperation	Level V Resource Sharing	Level VI Formal Planning
General Description	At this level, libraries exist as separate and independent institutions, either by choice or by lack of any precedent for cooperation. Many times, staffs have never met together.	At this level, libraries are still quite independent entities but experience sporadic communication. Some libraries may communicate more than others but all still rely primarily on their own resources to satisfy	At this level, communication becomes more purposeful and on-going in nature, focusing on a specific event or issue. Staffs may meet together on an irregular basis.	At this level, mutual goals or objectives guide the cooperative activities. Though actual materials may not be exchanged, there is an increased awareness of the town's total information resources. Much of this activity can still be conducted by interested individuals. Library staffs and administrators have an understanding of the services and mission of the other libraries involved in the cooperative group.	At this level, cooperation becomes more planned, systematic and on-going as the commitment to the whole of library service grows, Involvement of school administrators, town fiscal agents, trustees, etc. increases as many resource sharing activities involve policies or finances. Short and long term goals and plans may be developed.	At this level, cooperation exists on a frequiet and regular basis and involve more people. Short and long term goals and objectives for library service are developed and approved by the appropriate governing boards.

FIGURE 2.6 (Continued)

Characteristics of Activities	Level I No Involvement or Cooperation	Level II Informal Cooperation	Level III Formal Communication	Level IV Formal Cooperation	Level V Resource Sharing	Level VI Formal Planning
	-There has been no history of cooperation -Formal contacts have not been made between the two institutions -There is no public library in town -There are no library media personnel in the school or school system -There is a competitive or antagonistic behavior on the part of the professionals or boards -There are no phones in the school library media center	-Assignment alerts are given to public librarians by the school media specialist -Occasional phone calls for reference by either school or public librarians -Joint publicity of special library events	-Plan scheduled class visits to the public library -Public librarians visit school library media centers or school classrooms -Mutual planning and promotion of summer programs for children -Social contact through professional associations or workshops -Carpooling to professional events or workshops -Sharing of professional development opportunities	-Joint celebration of library events such as National Library Week -Union Lists of periodicals or other materials -Exchange of bibliographies -Cooperative data collection	-Shared storytelling, book talks, discussion groups, etc. -Loan of school materials to public library during the summer -School library media materials are available to public library patrons -Compatibility of hardware (video, etc.) throughout town or region -Shared display of special materials or projects -Mutual exchange of materials of any kind -Intradistrict delivery of materials to all libraries and library media centers in town -Regular articles in school or local newspapers, library bulletins, etc. -Shared films or film rental	-Some cooperative collection development -Cooperative policy development (selection, weeding, equipment, etc.) -Joint cataloging/technical processing -Cooperative equipment repair, service or purchase program -Shared goal setting for library service within the town -Common card catalog in one or both locations -Facilities sharing for district patron services -Extended hours at the school library media center to increase patron access

(Billman and Owens, 1985, pp. 186-187)

OCLC

The distribution of the Machine Readable Cataloging (MARC) tapes were made available by the Library of Congress to other organizations to develop an online database and to provide online services. The Ohio College Library Catalog originally provided online services to academic libraries within the state. Other libraries applied for the services and by 1988 there were over 18 million bibliographic records in the database. This database provides the foundation for other services, in addition to the online catalog with library holdings identified, including name authority file, interlibrary loan, acquisitions, and name-address directory. Subsets of the online catalog may be created to consolidate local catalogs.

Use of OCLC by school libraries continues to be limited. A 1982 survey by Rogers reported some schools in 16 states were using OCLC usually through a multitype network, with schools in eight states considering membership. In 1983, 49 schools and districts were in the system. The figure compiled during this research was 1,007 schools and districts in the system in 1988. Some states allow schools to participate through a processing center, state library, public library, or academic library.

The benefits of school participation in multitype library networking are documented. The barrier of cost is being tackled as librarians work toward solutions. In an unpublished report, Woolls (1985) noted that the current cost of the membership plans of OCLC were prohibitive to school libraries. She studied schools using OCLC within eight networks and provided a comprehensive analysis. This document confirmed several assumptions in support of the value of school libraries as participants in networks. As a result of the study, suggestions were made to OCLC to provide a special membership plan to school libraries. No action was taken, however.

LSCA

Federal support for libraries, beginning with the Library Services Act (LSA) in 1956, was designed to bring library services to unserved areas. LSA was amended through the years until 1964 when it became the Library Services and Construction Act. Title III of the act provided money for interlibrary cooperation. The money is appropriated to the state which develops its plan for the multitype library cooperation.

Lunardi (1987) investigated the national effect of LSCA Title III in stimulating public school library participation within cooperative library networks through a survey of

networks receiving LSCA funds. Results appeared discouraging; he calls the program "obscure" for school librarians. Yet, on a positive note he concludes that traditionally identified barriers: fiscal, legal, attitudinal, governance, planning, evaluation, and technological are not insurmountable. However, he continues, "Through reciprocal borrowing, sharing, and the working together of public, academic, special, and public school librarians in all facets of librarianship, horizons have broadened" (Lunardi, 1987, p. 153).

The problem seems to be one of communication and understanding. Lunardi summarized:

> For the most part, public school librarians are not only unaware of their networks' funding by LSCA Title III for the 1981-1982 fiscal year, they are generally uninformed about the funding levels of that program which they share. (Lunardi, 1987, p. 156-7)

Survey and interview research by Partridge (1988) was done in Mississippi. With a regional multitype library organization as her primary focus, she identified major obstacles to cooperation as perceived by school library media specialists. As in the Lunardi study, lack of information about the benefit of membership in a network, was evident. Psychological barriers, however, appeared less important than in previous studies.

Sheldon (1981), Lunardi (1987) and Partridge (1988) identified lack of information as significant barriers to school library participation in networks. A model is necessary not only to inform the school professionals, but also to provide a guide through the adoption process.

In the *School Library Media Annual 1983 Volume 1*, Aaron reviewed research studies on school libraries for a nine and one-half year period. Her recommendations for future studies concerning cooperation among various types of libraries were:

> a. What differences has participation in networking made in organizational structures of individual school library media programs?
>
> b. Do school library media programs receive equal treatment in and provide equal contributions to library networks?
>
> c. How can traditional barriers to cooperation be overcome in the school library media area? (Aaron, 1983, p. 367)

The issues are evident. This study will explore the process that school systems follow as their library program reaches out to other libraries for resources to meet the needs of students, teachers, and administrators of the schools. This reaching out involves the identification of holdings of other libraries, a policy for borrowing, and a mechanism for delivering the information to the end user.

Summary

In summary, diffusion of innovation theory, and the literature of innovations in education and in library services have been surveyed. Various, yet similar, models of the diffusion process have been examined. Rogers (1983) synthesized research in many areas of study to develop a model of the stages of the innovation-decision process. Miles (1964), Hall, Loucks, Rutherford, and Newlove (1975), Cory (1983), and Gray (1986) identified stages in the diffusion of educational innovations. Griffiths (1986), and Billman and Owens (1985) analyzed stages in the adoption process in libraries. Each of these studies has contributed to the present study and in the formation of a tentative model of school library participation in multitype library organizations.

Observations by Miles provide fundamental characteristics of the change process in the educational setting. Hall and Loucks focused on the individual in the adoption process. Huberman and Miles identified factors contributing to successful early use of innovations. The use of technology in education was the focus of Cory and Gray.

The contributions and positive changes resulting from

school libraries in multitype library organizations were identified by Doll (July 1984), Falsone (1977), NCLIS (1978), Greenberg (1981), and Sorensen (1984).

Success in overcoming barriers was reported by Immroth (1978) and Lunardi (1987).

Studies by Sheldon (1981), Lunardi (1987), and Partridge (1988) illustrate that schools have been slow to adopt the innovation and suggest that they are not aware of the opportunities provided with network membership.

Individual attitudes of librarians were studied by Weeks (1982) and (Chapman 1985) with opposite results, possibly due to the difference in philosophy of library service in two different states.

Chapter 3. RESEARCH METHODOLOGY

Introduction

The purpose of this study is to develop a model that identifies the stages and characteristics of each stage that a school system follows when becoming a participant in a multitype library organization. Factors to be included are: the year the library media program of a school system becomes a member of a multitype library organization, the type of organization, the use of technology in library management and service, the level of financial support, the level of human support, and the activities or services, such as exchange of holdings information and cooperative technical services.

This chapter describes the methodology used and is divided into the following sections: (1) innovation stages - theory and research, (2) research questions, (3) population and sample, (4) construction of survey instruments, and (5) data analysis.

Innovation Stages -- Theory and Research

The process of theory building has been described in the literature as a series of stages or steps (Donohew and Palmgreen, 1981; Westly, 1963; Reynolds, 1971). Formal

models are described by Kaplan (1964) as having a flexibility of conceptualization.

> Certain things must be true in the concrete if they are to be capable of being represented by a particular abstract form. The abstractness of the formal model has the additional enormous advantage of extreme generality from the outset: a variety of matters may be so structured as to exhibit the identical form. Thus the transmission of ideas may reveal the same pattern as the spread of an epidemic ... or the diffusion of information. (Kaplan, 1964, p. 274-5)

Another kind of model identified by Kaplan is a pattern model which provides understanding not prediction. He states that a model will prepare one "for events to come and [to] choose more wisely among courses of actions open to us" (Kaplan, 1964, p. 356).

The purpose of this study was not to verify the stage or phase theorem, but to identify the decision-making processes that occur as school systems become full participating members of a library organization. Thus, a model of the decision-making process or stages that school systems have followed as they became participating members of a library organization was constructed in order to provide an understanding of the process. To do this, a preliminary model has been constructed from the study of the literature. Data was collected from library media services supervisors and/or library media specialists.

Three phases of the diffusion of innovations are identified in Figure 3.1 and some defining indicators for each phase are listed. An elaboration of the indicators is provided after the table.

FIGURE 3.1

SCHOOL LIBRARY NETWORKING MODEL

	Phase I	Phase II	Phase III
TECHNOLOGY SUPPORT	Some evidence of use of computers	Periodic use of computers	Regular use of computers
	No telephone in media center	Efforts to obtain telephone	Telephone in media center
	Awareness of emerging technologies	Investigation of emerging technologies	Computer upgrade for tele-communications
FINANCIAL SUPPORT	None budgeted for ILL	Requests for ILL budget	ILL costs in budget
	None for net-working activities	Special funds for network activities	Communications expenses & network fees in budget

FIGURE 3.1 (Continued)

SCHOOL LIBRARY NETWORKING MODEL

	Phase I	Phase II	Phase III
HUMAN SUPPORT	Informal meetings	Formal meetings	Organization formed
	Casual requests for ILL	Centralized requests for ILL	Individual requests for ILL
	Informal agreements	Preliminary policies being formed	Written policies
	Awareness of external resources	Investigation of external resources	Use of external resources
	No added staff	Requests for staff made	Staff added
	Little system level consulting service	Media services position at system level	Consulting services by network

FIGURE 3.1 (Continued)

SCHOOL LIBRARY NETWORKING MODEL

	Phase I	Phase II	Phase III
ACTIVITIES AND APPLICATIONS	Exchange lists of serials	Union list of serials	Union catalog of serials
	Exchange lists of special collections	Union list of special collections	Union catalog of special collections
	Awareness of cooperative collection development	Exploration of cooperative collection development	Cooperative collection development
	Awareness of cooperative technical services	Exploration of cooperative technical services	Technical services cooperation
	Awareness of material delivery methods	Investigation of material delivery methods	Use of material delivery system
	Awareness of external resources in reference skills	Use of union lists taught in reference skills	Regular use of external resources by students

A typical scenario for a school library in Phase I, keyed to the model is as follows:

1.11 Some evidence of the use of computers by school media specialists. This use may take place in the media center or may require the media specialist to go to another room to have access to the computer. At least one application package for library management is evident, such as word processing for letters, announcements, signs, and reports.

1.12 The library does not have a telephone. The librarian must use an office telephone or one available to teachers to call for requests or to receive requests for loan of materials.

1.21 No budget is appropriated for interlibrary loans. Costs for mailings are absorbed by the building postage budget or local discretionary funds (fines, book fair profits).

1.22 No budget is appropriated for network dues or membership fees.

1.31 Librarians hold informal irregularly scheduled meetings. These meetings usually include just school media specialists. Networking involves communication. The first step to networking is communication among librarians in informal meetings to discuss common problems and to work on mutual solutions. A movement towards Phase II is evidenced by meetings with librarians from other types of libraries, most frequently the public library.

1.32 Requests for borrowing from other libraries are casual and infrequent and made by the school media specialist on behalf of a patron. Arrangements for interlibrary loan are informal. "Do you have something on ...?" or "May I borrow your filmstrip on ....?" are typical requests in this phase.

1.33 The school media specialists are aware of external resources. The awareness results from activities in informal meetings or professional reading and/or conferences.

1.34 No additional personnel are provided at either the district level or the building level for cooperative activities.

1.35 Little consulting service is provided at the district level.

1.41 Lists of serial holdings are exchanged among libraries. Awareness of the holdings of other libraries is necessary before regular requests can be made. The patron is either sent to the other library to use a serial or a request for a copy of an article is made by telephone.

1.42 Lists of special collections are exchanged among libraries. These lists may be of areas of strength in the collection: subjects, audio visual, reference.

1.43 There is an awareness of different material delivery methods. During this phase, materials may be sent on school courier or hand delivered by whomever is traveling in the needed direction.

1.44 Reference skills instruction includes awareness of external resources.

A typical Phase II system might be characterized as follows:

2.11 Periodic use of computers by school media specialists. More than one application of the microcomputer for library management is used.

2.12 Investigation and requests for a telephone for the media center are made. Justification is made by demonstrating the need for the instructional program of the school and access to external resources.

2.13 Investigation of newer technologies begins with attendence at professional meetings and/or professional reading.

2.2 A one-time grant or special funding is available for networking activity. The costs of equipment and communication charges are barriers to networking. This special funding allows libraries to purchase the initial equipment and services.

2.31 Formal meetings are held in Phase II. A topic of concern is the sharing of resources and cooperative activities. Administrators from the school district and board members from participating libraries are invited to attend meetings as cooperative endeavors are explored.

2.32 Requests for interlibrary loan are formal, often channeled through the central office of the school district or directed through one library such as the public library. Reciprocal borrowing policies are developing.

2.33 Serious investigation of external resources begins. The school media specialist may participate in workshops on the use of online databases such as Dialog's Classmate: Teach the Teacher. Explorations of vehicles for access to external resources are expanded.

2.34 Efforts are made at the system level for expanded staff.

2.35 A media services position is provided at the system level for supervision, consultation, and staff development.

2.41 The investigation and creation of a union list of serials takes place. This list is compiled from the exchange of lists that took place in Phase I.

2.421 Libraries investigate methods of creating a catalog of special collections identified in Phase I.

2.422 Libraries begin to consider cooperative collection development. By coordinating the selection of materials, more different titles can be made available in the area with the intention of providing access to the materials to patrons in the cooperating libraries.

2.423 Exploration of cooperation efforts for technical services: acquisitions, cataloging, and physical processing are begun.

2.43 Investigation continues on the problem of delivering materials to requesting libraries. Different services are explored such as local courier, postal service, and private delivery service.

2.44 Reference skills instruction includes use of the union lists from other libraries.

A typical Phase III system might be characterized as follows:

3.11 The school media specialist uses the computer for regular library management activities. These activities may include creation of databases for bibliographies, card production, overdues notices, automated circulation and/or catalog, online reference retrieval, CD-ROM reference services, telecommunications.

3.12 A telephone is installed in the media center. It is used for telecommunications and/or access to online database vendors. A WATS line may be accessible for union catalog searching and/or interlibrary loan requests.

3.13 A telefacsimile machine is used for transmission of periodical articles or short reference requests.

3.14 A modem is used for telecommunications. Electronic mail, bulletin board access, and online database vendors are services available.

3.21 Funds for networking are an item in the budget. Fees for dues, costs of interlibrary loans, charges for online vendors, costs for network participation are regularly provided for by the school district or state.

3.22 The telephone fees are covered in the budget.

3.31 Formal organization of the cooperating libraries takes place in Phase III. Policies and guidelines for interlibrary loan, cooperative collection development, materials delivery, and staff development are formally adopted by the governing bodies of the participants.

3.32 Patrons may make requests for interlibrary loans in the individual schools. These requests are forwarded by the school directly to the source.

3.33 Use of external resources is a regular activity. When students do research, they are not restricted to materials located in their school. Searching for materials in other libraries or listed in online databases is integrated into their research skills.

3.34 Additional staff is assigned with duties pertaining to network activities.

3.35 Consultation services are provided by the network. Staff development workshops, building level training, telephone support are available for members.

3.41 A union catalog of serials is developed and electronically stored. It is available in member libraries and accessible in one or more modes, such as floppy disk, dial-up service, microfiche, or CD-ROM.

3.421 A union catalog of book and non-book materials is created. The form may be CD-ROM, online public access catalog, or dial-up catalog.

3.422 Libraries engage in cooperative collection development including determination of selection policy, collection evaluation, and selection of materials.

3.423 Some technical services are provided by the network. Individual libraries have the option to use these services.

3.43 The delivery of materials is by telefax, online, or by contracted service.

3.44 Reference skills instruction includes access to external resources. Students are taught search strategies and have the resources available to use them.

Using the pattern of Yin (1979), a model of passages and cycles has also been constructed from information in the literature. (Figure 3.2)

FIGURE 3.2

SCHOOL SYSTEM PASSAGES AND CYCLES

Motivator	Passages	Cycles
TECHNOLOGY	Microcomputer regularly used as library administration	Survives school shifts in computer locations
	Telephone used for access to external resources	Survives budget cycles
FINANCIAL SUPPORT	Change from soft to hard money	Survives annual budget cycles
	Supplies and maintenance provided by school system	Survives annual budget cycles

FIGURE 3.2 (Continued)

Motivator	Passages	Cycles
HUMAN SUPPORT	Meetings become part of job description	
	Skills become part of professional standards	Skills taught during many training cycles
	Establishment of organizational status	Attainment of widespread use
ACTIVITIES	Use of network becomes part of standards	
	Use of external resources integrated into school curriculum	
	Establishment of union database of holdings	Attainment of widespread use
	Logistics of delivery system established	Survives annual budget cycles
	Cooperative collection development	
	School representation in governance	Supported by school administration

Research Question

The successful inclusion of the school library media center in a fully articulated network involves considerable planning and organization for technological change. A preliminary model of stages of school system participation in library networks has been developed with the major

activities for each stage identified. This study attempted to verify the model by surveying school library network members and examining which factors have influenced their degree of participation.

Population and Sample

The identification of school systems who are members of a local, regional, state, or national network would appear to be a simple reference question; however, the printed and online directories of networks are not consistent in their counting methods. In *The Report on Library Cooperation 1986*, the statistics were collected by state library officers. Some of these reporting officials have counted school systems, while others have used individual schools.

The National Center for Education Statistics' *Directory of Library Networks and Cooperative Library Organizations 1985* (NCES Directory) does not identify members of the 968 networks included in their listing. A school data service used the term "network" and respondents, some not familiar with library networks and not sure what was meant, counted microcomputers, linked together in a classroom or in the school building, as "networks."

Griffiths, Havelock, and Sweets used the *Directory of American Libraries* as one of three print sources to select sites for their study. Information from developers of the

innovations that were being studied helped to identify libraries that could be used in the study. They did not attempt, however, to select a random sample from a defined population but rather used an opportunistic sample.

Lunardi experienced difficulty in identifying public school libraries participating in cooperative Library Services and Construction Act (LSCA) funded library networks. Two directories proved of value in his research: the *Directory of Library Networks and Cooperative Library Organizations, 1980* (NCES Directory) and *The Report on Library Cooperation 1980* published by the Association of Specialized and Cooperative Library Agencies. After eliminating duplication of reporting, he determined there were a total of 241 LSCA funded networks. By establishing a sampling process to assure at least one network being selected from each state, he identified a total of 63 known cooperative library networks. The sample included a total of 126 public school libraries with no more than two from any one network.

Martin's *Library Networks, 1986-87* concentrates on networks which are vendors for OCLC services. She identifies only 15 networks with public school membership. Of these, 13 are OCLC vendors; the other 2 are Western Library Network (WLN), and Cooperative Library Agency for

Systems and Services (CLASS) in California. The names of the school systems included in Martin's work are limited to OCLC members. (Martin, 1986)

Because of the variety of types of networks and methods of counting, it was difficult to determine the population from which to draw a sample. Figure 1.1 in Chapter 1 was compiled from the state reports in *The Report on Library Cooperation 1986*. One hundred fifty-one multitype cooperatives reported schools as members; however, since each state completed its own form, some reported the number of individual schools while others reported school systems. To identify the school systems that are members of library organizations, the director of each network that Wareham identified as having schools as members were sent letters requesting identification of the school system members in the network. Telephone calls were made to networks not responding to the request. A table of the networks with school membership was compiled giving state and number of school systems.

Upon examination of the information gathered, the networks were divided into six organizational patterns: OCLC vendors, Western Library Network members, state networks, state networks divided into regional library systems, state school library systems, and local multitype

library organizations. Some states have more than one of these patterns causing some overlap of school systems in network groups. The following groupings were designated for this study:

OCLC vendors. The following networks with school members serve as vendors of OCLC services: AMIGO (Texas, Arkansas), ILLINET, MLC (Michigan), MINITEX (Minnesota, South Dakota), NEBASE (Nebraska), NELINET (Maine, New Hampshire), OHIONET, PALINET (Pennsylvania), SOLINET (North Carolina, South Carolina, Georgia, Alabama, Florida, Mississippi), and SUNY/OCLC (New York).

States with regional library systems. In the following states, the libraries have been grouped geographically for cooperative activities: California (library councils), Colorado (regional library systems), Connecticut (library councils), Illinois (library systems), Indiana (ALSA (Area Library Service Authorities), Kansas (library systems), Michigan (library cooperatives), Minnesota (interlibrary exchanges), Missouri (library networks), Nebraska (library systems), New Jersey (regional library cooperatives), New York (BOCES (Boards of Cooperative Educational Services) for schools; Public Library Systems; and Reference and Research Library Resources Systems (3 R's), and Wisconsin (library councils).

State wide school library systems. The states of Michigan, Minnesota and New York have state-wide school library cooperatives.

Western Library Network. WLN includes schools from Alaska, Idaho, Montana, Oregon, and Washington.

State networks. Florida, Kentucky, North Carolina, Pennsylvania, Rhode Island, and Vermont have state-wide networks with some school systems as members.

Local multitype library organizations. Eleven states have school libraries in local organizations. These states are Idaho, Maryland, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Texas, and Virginia.

Charts for each of the six organizational patterns were created. Each state and the networks within the state were identified along with the number of school systems in each network as identified from the literature, network brochures, and directories. Complete lists of the library organizations in each cluster are in Appendix B.

Three network clusters were selected to be used for this study: OCLC vendors, state-wide multitype networks, and state-wide school networks. Using the charts created for these organizational patterns, a single list was compiled of the 17 states with 3,613 school systems in at least one

network. The school systems were numbered from this list using network directories, when available, or *Patterson's American Education* (Moody, 1988). Using a computer generated list of random numbers, a sample of 674 was identified from this list. (Figure 3.3)

FIGURE 3.3

POPULATION AND SAMPLE

State	Cluster	No. of School Systems	No. in Sample
California	Regional	37	6
Colorado	Regional	177	36
Connecticut	Regional	149	28
Illinois	Regional, OCLC	557	93
Indiana	Regional	267	48
Kansas	Regional	113	20
Michigan	Regional OCLC & school	493	104
Minnesota	Regional OCLC & school	358	42
Missouri	Regional	80	1
Nebraska	Regional OCLC	298	57
New Jersey	Regional	350	83
New York	Regional OCLC & school	664	140
North Carolina	OCLC/SOLINET	2	0
Ohio	OCLC/OHIONET	2	0
Pennsylvania	OCLC/PALINET	3	0
Texas	OCLC	1	0
Wisconsin	Regional	62	16
		3613	674

Construction of Survey Instrument

The questionnaire was constructed following the factors in each aspect of the model. The self-administered survey

was sent to 674 persons in the school systems in the sample in October 1989. The individuals addressed varied and included district level persons for school media programs, school contact persons for the library network, superintendents, or building school library media specialists. (Appendix A)

A post card thank-you and follow-up reminder was sent three weeks later. The survey was mailed again in January 1990 to 136 in the sample in an attempt to raise the response rate above 50%. The Total Design Method of Dillman (1978) was applied.

Data Analysis

Profiles of Respondents

Descriptive statistics were used to provide a profile of the respondents by (1) state, (2) type of network, (3) position of respondent, (4) size of school district, (5) school type, and (6) level of involvement.

Profiles by the reported level of involvement in a network were done by (1) state and (2) size of school district.

Testing the Model

Chi-square tests were performed on each variable in the questionnaire in relation to the level of involvement reported by the respondent. Additionally, the chi-square

test was performed on each variable with the data grouped by (1) position of person completing the questionnaire, (2) size of school district, (3) type of network, and (4) length of time in the network.

Chapter 4. ANALYSIS OF DATA

Analysis of Data

The purpose of this study was to test a model that identifies the stages a school system will follow when becoming a participant in a multitype library network. Six types of networks were identified (See Chapter 3.); school systems were selected from three of these types: regional network serving as an OCLC broker, state-wide multitype network, and state-wide school network.

A total of 3,613 school systems in 17 states were recognized as being in one or more of the three types of networks identified for this study. Questionnaires were sent to 674 persons in these systems, a random sample of 18.7%. The individuals addressed varied and included district level persons for school media programs, school contact persons for the library network, superintendents, or building school library media specialists in school districts in the 13 states in the sample. Three weeks after the first mailing, a postcard was sent to the non-respondents. To increase the response rate, a third mailing was done two months later and included another copy of the questionnaire and an additional cover letter. Three hundred

sixty-two (53.7%) of the questionnaires were returned, of which 311 provided data, 47 reported they were not participating in a network, and 4 arrived after analysis had been done. Non-respondents were assumed not to be significantly different from respondents due to a comparison of data received before and after the third mailing. Non-respondents were proportionate by state. The exceptions were the two states with a small number in the sample in which case respondents were over 80% of the sample from that state.

Profile of Respondents

Profiles of the respondents describe the composition of the school systems in this study by state, type of network organization, student population, and title of the person completing the questionnaire. Table 4.1 depicts the states, the population of school systems, the sample, the sample percent of the population in each state, and the number of respondents. The population number is a total of the school systems reported to be in a network in the state. Respondents are from each of the states examined in this study.

TABLE 4.1

COMPOSITION OF THIS STUDY

State	Population Number	Sample Number	Sample % of Pop.	Respondents Number
California	37	6	16.2	5
Colorado	177	36	20.3	18
Connecticut	149	28	18.8	15
Illinois	557	93	16.7	49
Indiana	267	48	18.0	22
Kansas	113	20	17.7	14
Michigan	493	104	21.1	44
Minnesota	358	42	11.7	23
Missouri	80	1	1.3	1
Nebraska	298	57	19.1	38
New Jersey	350	83	23.7	50
New York	664	140	21.1	73
Wisconsin	62	16	25.8	10
TOTAL	3605	674		362

A profile by state illustrates the distribution of the sample and respondents. (Table 4.2) The percentages are calculated on the total sample of 674. Almost one third of the respondents who are not participating in a network are in Nebraska. New York, with the highest percent of the sample, also has the highest percent of respondents.

TABLE 4.2

SAMPLE AND RESPONDENTS

STATE - BY - STATE

State	Sample Number	Percent of Total Sample	Number of Respondents NP*	N	Percent of Total Sample
California	6	.9	1	4	.74
Colorado	36	5.3		18	2.67
Connecticut	28	4.2	3	12	2.23
Illinois	93	13.8	3	46	7.27
Indiana	48	7.1	1	21	3.26
Kansas	20	3.0	2	12	2.08
Michigan	104	15.4	6	38	6.53
Minnesota	42	6.2	5	18	3.41
Missouri	1	.2	1	0	0.15
Nebraska	57	8.5	16	22	5.64
New Jersey	83	12.3	6	44	7.42
New York	140	20.8	2	71	10.83
Wisconsin	16	2.4	1	9	1.48
TOTAL	674	100.1	47	315	53.71

* A member but Not Participating in a network

The rankings of states by the percent of the sample that responded are presented in Table 4.3. All of the states in the sample had a return rate over 50%. For each sample state, the type of network membership is identified. All states have some type of multitype library networks; only two states, California and Missouri, do not include the entire state. Six states have schools in OCLC membership service organizations: California, Illinois, Michigan,

Minnesota, Nebraska, and New York. Two states, New York and Michigan, have regional school systems which provide library services. These same two states provide networking service to the schools with all three organizational structures.

TABLE 4.3

TYPE OF NETWORK AVAILABLE IN STATES

AND PERCENT OF SAMPLE IN EACH STATE RESPONDING

State	Type of Network Organization*			Percent of Sample in the State Responding
	R	O	S	
Missouri	R2			100.00
California	R2	O		82.50
Kansas	R1			70.00
Nebraska	R1	O		66.67
Wisconsin	R1			62.50
New Jersey	R1			60.24
Minnesota	R1	O		54.76
Connecticut	R1			53.63
Illinois	R1	O		52.69
New York	R1	O	S	52.14
Colorado	R1			50.00
Indiana	R1			45.83
Michigan	R1	O	S	42.31

R1 = Regional multitype network members, all of state
R2 = Regional multitype network members, not all of state
O = Members of agency offering OCLC service
S = School regional/state network members

The questionnaire was addressed to the system level individual responsible for media programs or, in the absence of such a person, to the contact person for the library network. In the absence of either of these, a building

level media specialist or superintendent was addressed. Table 4.4 lists the positions or titles of the persons completing the questionnaires, when indicated. Over 30% of the respondents were high school level media specialists, while over 60% of the respondents who identified their positions were building level professionals. Nearly 20% did not identify their positions or titles.

TABLE 4.4

PROFILE DISTRIBUTION

BY POSITION REPORTING

Position	Number	Percent
Building Level		
High School Librarian	97	30.79
SLMS, LMS, Librarian	46	14.60
K-12 SLMS	13	4.13
Elementary SLMS	11	3.49
Jr. Hi/Middle School SLMS	6	1.90
Jr/Sr High SLMS	6	1.90
Elementary/HS SLMS	3	.95
Ed. Media Specialist	1	.32
Sub-total	183	58.08
School System Level		
Director of Media Services	43	13.65
District Level Supervisor	13	4.13
Coordinator of Media Services	8	2.5
Unit librarian	6	1.90
Consultant	1	.32
Instructional Tech. Coord.	1	.32
Manager of Media Services	1	.32
Principal	1	.32
Superintendent	1	.32
23.81 Sub-total	75	
Library Aide	1	.32
Not given	56	17.78
	315	99.99

The numbers of students within these districts were reported by 255 respondents. (Table 4.5) Over one-half of the respondents were from districts with fewer than 2,500 students, and over two-thirds were from districts with fewer

than 5,000 students. Only two reporting school systems had student populations over 100,000.

TABLE 4.5

DISTRIBUTION OF RESPONDENTS TO

NUMBER OF STUDENTS SERVED

Number of Students in School System	Count	Percent of	Cumulative Percent
Under 500	54	17.36	17.36
500-999	52	16.72	34.08
1,000-2,499	67	21.54	55.62
2,500-4,999	42	13.50	69.12
5,000-9,999	19	6.11	75.23
10,000 +	21	6.75	81.98
Not given	56	18.01	99.99
	311	99.99	

As would be expected due to the nature of high school course assignments, a higher percent of the secondary schools use networking services. Respondents reported that over 93% of the secondary schools in the districts were active in networks, slightly more than 80% of elementary schools were active. Combining all types of schools, slightly over 85% of the schools in the districts were participating in networks. (Table 4.6)

TABLE 4.6

DISTRIBUTION OF INDIVIDUAL SCHOOL TYPES

PARTICIPATING IN A NETWORK

* Type of School	Schools in District	Schools in a Network	Percent in a Network
Secondary	566	529	93.46
Elementary	1289	1068	82.85
Other	146	114	78.08
TOTALS	2001	1711	85.51

* The Center for Education Statistics, Office of Educational Research and Improvement, United States Department of Education has defined secondary schools as schools where the lowest grade taught is greater than sixth grade and the highest grade taught is greater than seventh. Elementary schools are defined as schools in which the lowest grade taught is less than fourth grade and the highest grade taught is less than ninth grade. All other organizational patterns, such as K-12, middle schools, and grades 7-9, are classified as "other".

Profile by Level of Involvement

Respondents were asked to indicate their level of participation in a library network on a Likert-like five point scale from 0 to 4. For statistical purposes in this study, the scale was collapsed into three levels of involvement, a conservative approach to keep the number of respondents divided as evenly as possible among the three

classifications. Respondent indications 0 through 2 were classified as "Low involvement." (N=139) Those indicating participation at 3 were classified as "Medium involvement." (N=85) Indications of 4 were classified as "High involvement." (N=65) Participating network members who did not indicate a level of involvement, yet completed the remainder of the questionnaire, were dropped from statistical analysis using the level of network involvement. Nine respondents indicated no involvement, yet were members of networks; these have been included in the "Low involvement" group. Table 4.7 provides a profile of respondents at each level.

TABLE 4.7

PROFILE OF RESPONDENTS BY LEVEL OF INVOLVEMENT

Level of Involvement	N	Percent of Involved
Low Involvement	139	48.10
Medium Involvement	85	29.41
High Involvement	65	22.49
TOTALS	289	100.00
Not given	22	

Table 4.8 profiles the respondents by state indicating the year that schools first became involved in a network in

the state and their level of involvement. The percent of respondents at each level is given, including the totals. Twenty-two respondents did not indicate their level of involvement. Only in New York, which began pilot projects in school library systems in 1979 with state legislated funds, is the largest percentage of participants at the high involvement level. In all other states, the largest percentage is at the low level of involvement.

TABLE 4.8

PROFILE OF RESPONDENTS

WITH LEVEL OF INVOLVEMENT AND STATE

State	Year Network Initiated	Involvement Level: Low N	Low %	Medium N	Medium %	High N	High %
Kansas	1986	5	45.4	5	45.4	1	9.1
Wisconsin	1985	6	66.7	3	33.3		
Nebraska	1984	11	61.1	7	38.9		
New Jersey	1984	26	65.0	8	20.0	6	15.0
Connecticut	1983	8	66.7	2	16.7	2	16.7
Minnesota	1979	12	70.6	3	17.6	2	11.8
New York	1979	17	25.0	15	22.1	36	52.9
Michigan	1977	13	38.2	14	41.2	7	20.6
Colorado	1976	8	47.1	7	41.2	2	11.8
Indiana	1975	8	50.0	6	37.5	2	12.5
Illinois	1966	22	51.2	14	32.6	7	16.3
California	varies	3	75.0	1	25.0		
Total		139	48.1	85	29.4	65	22.5

The respondents were also analyzed by school district size and the level of involvement. (Table 4.9) In five of the groups based on student size, the highest percentage of involvement is in the low level of involvement. In only one of the groups was the distribution of involvement different from the overall distribution. In school systems with student size of 5,000-9,999, approximately one-third are in each of the three levels of involvement. Very few (slightly over 1%) did not indicate their involvement level or enrollment figures, and nearly one-fifth did not provide school system enrollment figures yet did indicate involvement level.

TABLE 4.9

PROFILE OF RESPONDENTS BY

SCHOOL DISTRICT SIZE

Number of Students	No Answer	Involvement Level Low	Medium	High	Total
Under 500	3	27	17	7	54
%	5.7	50.0	31.5	13.0	
500-999	1	26	16	9	52
%	1.9	50.0	30.8	17.3	
1,000-2,499	5	23	20	19	67
%	7.5	34.3	29.9	28.4	
2,500-4,999	8	16	10	8	42
%	19.0	38.1	23.8	19.0	
5,000-9,999	1	6	5	7	19
%	5.3	31.6	26.3	36.8	
10,000 plus	3	10	5	3	21
%	14.3	47.6	23.8	14.3	
No response	1	31	12	12	56
%	1.8	55.4	21.4	21.4	
	22	139	85	65	311
	7.1	44.7	27.3	20.9	

Testing the Model

A preliminary model of stages of school system participation in a library network was developed, with major activities for each stage identified. (See Chapter 3.) The model follows those stages in the innovation adoption and diffusion literature and was constructed from the study of

the literature, observation, and informal interviews. The model is composed of four primary aspects: technological support, financial support, human support, and activities and applications. Within each aspect, anticipated events at each of three stages of participation in a network were identified.

These anticipated events were used in the construction of the survey questionnaire. (See Appendix A) Respondents were asked to evaluate the significance of each event in their participation in a network. A scale from 0 for "Not a Factor" to 4 "Highly Significant" was used for this purpose. In this analysis, the ratings have been collapsed into "Low" (ratings 0 - 1), "Medium" (ratings 2-3), and "High" (rating 4) significance. In other works, if an event consistently received a 0 or 1 rating (Low), it would not be found contributing to the model; conversely, those events with ratings of 4 would be considered as essential.

To test the model, the chi-square test was used to determine if a statistically significant difference exists among the rating of each activity (Low, Medium, and High) and the level of involvement in a network. This statistic determines whether an observed frequency distribution departs significantly from a random or chance distribution. Since chi-square is not a measure of the degree of

association between two variables, gamma coefficient values are also reported. The gamma coefficient is a test of association with scores from -1 to +1 (representing direction as well as the magnitude of the association). The level of significance was set at .05. Respondents not marking the scale of involvement were excluded in the chi-square tests. Percentages do not always total 100 due to rounding.

The chi-square is based on the assumption that there is no relationship between two variables, for example, the rated importance of each event and the level of network involvement of the subjects in this study. When the observed frequencies are not equal to the expected frequencies, the chi-square value increases. In the following tables, the observed values are presented along with their percentages. Below each table the computed chi-square and the degrees of freedom used in the computation are indicated. The probability that the difference in the observed and expected frequencies is due to chance is indicated by the value of *p*. The larger the gamma coefficient, the stronger the association between the level of involvement and the event.

Tables 4.10A through 4.10C present the data for the first aspect, technological support. Summary tables for the

other aspects follow. Data for each of the other aspects are in Appendix C. The tests were performed using a personal computer with the software, *Systat: The System for Statistics for the PC.*

TECHNOLOGICAL SUPPORT. All three activities, the availability of a telephone in the media center, the use of a computer for library management, and the availability of telecommunications tested significant at the .05 level. A higher percentage of respondents at each level of involvement rated the availability of a telephone as highly significant, especially those respondents at the highest level of involvement.

TABLE 4.10A

TABLE OF SIGNIFICANCE OF TECHNOLOGICAL SUPPORT:

TELEPHONE IN THE LIBRARY MEDIA CENTER

BY LEVEL OF INVOLVEMENT

	Level of Involvement							
Significance	Level 1		Level 2		Level 3		Total	
	n	(%)	n	(%)	n	(%)	n	(%)
Low	51	(18.1)	25	(8.9)	10	(3.6)	86	(30.6)
Medium	32	(11.4)	16	(5.7)	12	(4.3)	60	(21.4)
High	52	(18.5)	43	(15.3)	40	(14.2)	135	(48.0)
TOTAL	135	(48.0)	84	(29.9)	62	(22.1)	281	

chi-square = 13.433, df=4
p=0.009 (significant at p<.05)
gamma coefficient = 0.302

The use of a microcomputer for library management was rated low or medium, at level 1 (low) of involvement; while for the level 3 of involvement, the use of a microcomputer was rated highly significant in their network participation.

TABLE 4.10B

TABLE OF SIGNIFICANCE OF TECHNOLOGICAL SUPPORT:

USE OF A MICROCOMPUTER FOR LIBRARY/MEDIA CENTER MANAGEMENT

BY LEVEL OF INVOLVEMENT

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	58 (20.9)	28 (10.1)	13 (4.7)	99 (35.7)
Medium	35 (12.6)	16 (5.8)	19 (6.9)	70 (25.3)
High	39 (14.1)	40 (14.4)	29 (10.5)	108 (39.0)
TOTAL	132 (47.7)	84 (30.3)	61 (22.0)	277

chi-square = 14.142, df=4
p=0.007 (significant at p<.05)
gamma coefficient = 0.271

Almost half of the total number of respondents rated the availability of telecommunications as low significance. Telecommunications provides access to on-line union catalogs, database services, electronic bulletin boards, and electronic-mail. The rating of low significance by respondents at level 1 of involvement reflects the number of school systems which have not yet begun to use

telecommunications for electronic communications, interlibrary loan, and online database searching.

TABLE 4.10C

TABLE OF SIGNIFICANCE OF TECHNOLOGICAL SUPPORT:

USE OF TELECOMMUNICATIONS

BY LEVEL OF INVOLVEMENT

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	76 (28.9)	28 (10.6)	21 (8.0)	125 (47.5)
Medium	31 (11.8)	24 (9.1)	19 (7.2)	74 (28.1)
High	16 (6.1)	24 (9.1)	24 (9.1)	64 (24.3)
TOTAL	123 (46.8)	76 (28.9)	64 (24.3)	263

chi-square = 23.438, df=4
p=0.000 (significant at p<.05)
gamma coefficient = 0.391

Detailed tables for each event in each aspect are in Appendix C. Tables 4.11 through 4.14 provide summaries of the test results.

TABLE 4.11

SUMMARY TABLE OF SIGNIFICANCE OF

TECHNOLOGICAL SUPPORT

Item	chi-square	p	gamma coef.
Telephone in the media center	13.433	0.009 *	0.219
Use of a microcomputer for library/media center management	14.142	0.007 *	0.271
Use of telecommunications	23.438	0.000 *	0.391

* significant at p<.05, df=4

FINANCIAL SUPPORT. Three events were tested that relate to financial support in the school district budget: funding for interlibrary loan, funding for network dues, and funding for network activities. Two of the three events appear to be insignificant to network participation. These two events pertained to local funding for the expenses of interlibrary loan and network dues, the latter showing a negative gamma coefficient of association. The types of networks used in

this study are funded at the state level. (See Appendix C, Tables C.2A - C.2C for complete figures.)

TABLE 4.12

SUMMARY TABLE OF SIGNIFICANCE OF

FINANCIAL SUPPORT

Item	chi-square	p	gamma coef.
Funding for inter-library loan	3.396	0.494	0.021
Funding for network dues	1.256	0.869	-0.034
Funding for network activities	13.933	0.008 *	0.235

* Significant at p<.05, df=4

HUMAN SUPPORT. The results of the chi-square test for human support items were significant indicating a relationship of the ratings of each event and the level of involvement of the respondents. Scheduled meetings (p=.000), written interlibrary loan policies (p=.000), local librarian organization (p=.028), use of external resources by students (p=.001), additional staff support (p=.028), and support on the school district level (p=.000) were significant at the .05 level. It should be noted that gamma was low for formal organization and additional staff. Table

4.13 summarizes this aspect. (See Appendix C, Tables C.3A - C.3F for full charts.)

TABLE 4.13

SUMMARY TABLE OF SIGNIFICANCE OF

HUMAN SUPPORT

Item	chi-square	p	gamma coef.
Scheduled meetings	35.844	0.000 *	0.442
Written policies	38.139	0.000 *	0.452
Formal organization	10.788	0.029 *	0.171
Use of external resources by students	18.652	0.000 *	0.297
Additional staff	10.876	0.028 *	0.125
System level support	36.825	0.000 *	0.477

* significant at p<.05, df=4

ACTIVITIES AND APPLICATIONS. Six of the seven items of this section tested significant at the .05 level indicating that these items contribute significantly to the increase in involvement of network participants. These six include the exchange of serials holding lists (p=0.000), formation of a union catalog of serials (p=0.000), special collection information exchange (p=.028), cooperative collection development (p=0.000), cooperative technical services (p=.007), and a materials delivery system (p=0.000). Teaching the use of external resources did not appear to be

significant to participation in a network. Table 4.14 summarizes the events of this aspect. (See Appendix C, Tables C.4A - C.4G for full tables.)

TABLE 4.14

SUMMARY TABLE OF SIGNIFICANCE OF ACTIVITIES AND APPLICATIONS

Item	chi-square	p	gamma coef.
Serials lists exchanged	38.697	0.000 *	0.396
Union list of serials	38.693	0.000 *	0.472
Special collections information exchanged	10.896	0.028 *	0.277
Cooperative collection development	21.765	0.000 *	0.395
Cooperative technical services	14.133	0.007 *	0.180
Materials delivery service	36.885	0.000 *	0.542
Teaching the use of external resources	9.330	0.053	0.206

* significant at p<.05, df=4

Testing the Model by Examination of Parameters

To examine the model further, additional tests were performed on the data by (1) type of network, (2) position of person reporting, (3) size of school district, and (4) years in the network. The same tests of significance and of association were used as in the analysis by level of involvement. The number in the test (N) varies as some respondents omitted marking every item.

(1) TYPE OF NETWORK. The sample was drawn from the school systems reported to be in one or more of three types of networks: multitype state- or region-wide, school state-wide, and OCLC serviced networks. (See Table 4.3) All states in the study have a multitype network. Some school systems are also in school state-wide networks and/or OCLC vendor networks. Additional testing was done to determine if there were differences in the responses based on the type of network membership, school or OCLC. With these two types several events tested as significant and are summarized in Table 4.15. The tests indicate that ratings of events by participants of school networks which are supported by state legislated funding are significantly different from ratings of the same events by participants of OCLC networks. The complete chart is in Appendix C, Table C.5.

TABLE 4.15

EVENTS TESTING SIGNIFICANT:

SCHOOL NETWORK MEMBERSHIP VS OCLC NETWORK MEMBERSHIP

Event	n	chi-square	p	gamma coef.
Phone	215	7.826	.020 *	0.199
Microcomputer	211	7.222	.027 *	0.200
Funding for activities	201	7.276	.026 *	0.312
Written policies	205	11.918	.003 *	0.378
Formal organiza.	203	6.626	.036 *	0.300
Use of external resources	203	6.938	.031 *	0.287
System level support	191	6.247	.044 *	0.294
Serials list	202	21.298	.000 *	0.505
Serials catalog	198	13.665	.001 *	0.400
Cooperative col. development	196	10.582	.005 *	0.378
Delivery serv.	205	10.974	.004 *	0.298

* significant at p<.05, df = 2

(2) POSITION OF RESPONDENT. The responses indicating the titles or positions of the persons completing the questionnaires (See Table 4.4.) were divided into building level and system level responsibilities. Only three

activities tested as significant: availability of external resources (p=.029), additional staff support (p=.046), and exchange of serials lists (p=.047). Both building level and system level respondents at each level of involvement essentially agreed on the rating of the events. (See Appendix C, Table C.6 for complete table.)

TABLE 4.16

EVENTS TESTING SIGNIFICANT:

BUILDING LEVEL VS SYSTEM LEVEL RESPONDENTS

Event	n	chi-square	ρ	gamma coef.
Use of external resources	220	7.101	.029 *	-0.315
Additional staff	213	6.138	.046 *	-0.226
Serials lists	219	6.102	.047 *	-0.304

* significant at p<.05, df=2

(3) SIZE OF SCHOOL SYSTEM. The enrollment of the school systems in this study ranged from 83 to over 170,000. Six groups were formed from the profiles presented in Tables 4.5 and 4.9. To perform statistical tests, these six groups were collapsed into three groups: under 1,000 (n=106), 1,000 to 2,499 (n=67), and 2,500 and over (n=82). Five of the 19 factors were significant when considering the size of the

school system. These five (phone, telecommunications, formal organization, serials list, and serials catalog) were significant at the .05 level, indicating that the size of the school system made little difference on the ratings of all but five of the events. (See Table 4.17.) (Full table in Appendix C, Table C.7.)

TABLE 4.17

EVENTS OF SIGNIFICANCE:

SIZE OF SCHOOL SYSTEMS

Event	n	chi-square	p	gamma coef.
Phone	228	23.747	.000 *	-0.195
Telecom.	213	22.696	.000 *	-0.079
Organization	214	17.318	.002 *	-0.194
Serials list	213	9.923	.042 *	-0.182
Serials catalog	208	11.633	.020 *	-0.229

* significant at p<.05, df = 4

(4) YEARS SINCE ADOPTION. For the respondents, the time since first joining a library network ranged from 6 months to over 40 years. Three groups were formed for statistical analysis: those holding membership for five years or less (n=74), those holding membership for from six to ten years (n=83), and those holding membership for over ten years (n=80). Only two factors tested significant, use of the

microcomputer for library management (p=.020) and cooperative technical services (p=.026). The results of this test indicate that the length of time a school system has been a member of a network does not contribute to the ratings of the events by participants. The complete table appears in Appendix C, Table C.8.

TABLE 4.18

EVENTS TESTING SIGNIFICANT:

YEARS SINCE JOINING A NETWORK

Event	n	chi-square	p	gamma coef.
Microcomputer	245	11.616	.020 *	-0.129
Cooperative technical serv.	233	11.035	.026 *	-0.196

* significant at p<.05, df = 4

SUMMARY OF ADDITIONAL TESTS. For purpose of comparison, Table 4.19 illustrates each of the four parameters. Chi-square is given on the first line and p on the second.

SUMMARY OF TESTS OF SIGNIFICANCE OF PARAMETERS:

TYPE OF NETWORK, POSITION OF RESPONDENT,

SIZE OF SCHOOL SYSTEM, AND YEARS IN NETWORK

TABLE 4.19A

TECHNOLOGICAL SUPPORT

Event	Network df=2	Position df=2	Size df=4	Years df=4
Phone	7.826	5.145	23.747	4.288
p=	(.020 *)	(.076)	(.000 *)	(.368)
Computer	7.222	4.071	4.828	11.616
p=	(.027 *)	(.131)	(.305)	(.020 *)
Telecom.	3.265	0.453	22.696	.929
p=	(.195)	(.797)	(.000 *)	(.920)

*significant at p<.05

TABLE 4.19B

FINANCIAL SUPPORT

Event	Network df=2	Position df=2	Size df=4	Years df=4
Interlibrary loan	0.783	0.429	6.790	1.490
p=	(.676)	(.807)	(.147)	(.828)
Dues	1.135	1.047	9.197	2.595
p=	(.567)	(.592)	(.056)	(.628)
Activities	7.276	3.398	6.101	4.458
p=	(.026 *)	(.183)	(.192)	(.348)

* significant at p<.05

TABLE 4.19C

HUMAN SUPPORT

Event	Network df=2	Position df=2	Size df=4	Years df=4
Meetings	3.646	1.826	7.002	2.029
p=	(.162)	(.401)	(.136)	(.730)
Policies	11.918	1.848	0.227	7.503
p=	(.003 *)	(.397)	(.994)	(.112)
Organiz.	6.626	2.998	17.318	3.448
p=	(.036 *)	(.223)	(.002 *)	(.178)
Ext. res.	6.938	7.101	5.737	2.098
p=	(.031 *)	(.029 *)	(.220)	(.718)
Staff	4.332	6.138	7.117	4.355
p=	(.115)	(.046 *)	(.130)	(.360)
System supp.	6.247	5.075	8.857	8.187
p=	(.000 *)	(.047 *)	(.065)	(.085)

* Significant at p<.05

TABLE 4.19D

ACTIVITIES AND APPLICATIONS

Event	Network df=2	Position df=2	Size df=4	Years df=4
Serials list	21.298	6.102	9.923	7.389
p=	(.000 *)	(.047 *)	(.042 *)	(.186)
Union serials catalog	13.665	4.316	11.633	3.241
p=	(.001 *)	(.116)	(.020 *)	(.150)
Spec.Coll.	3.970	0.872	5.235	2.917
p=	(.137)	(.647)	(.264)	(.572)
Coop.Coll. Devel.	10.582	1.152	2.596	2.669
p=	(.005 *)	(.562)	(.628)	(.615)
Coop.Tech. Services	4.532	3.281	1.090	11.035
p=	(.104)	(.194)	(.896)	(.026 *)
Delivery Services	10.974	2.262	9.118	1.881
p=	(.004 *)	(.323)	(.058)	(.758)
Teaching use of external materials	3.270	2.628	2.743	4.285
p=	(.195)	(.269)	(.602)	(.369)

* significant at p<.05

Another question addressed in this study was the relationship between the level of involvement and the length of time a school system has been in a network. It is expected that an early adopter of network membership will fit reasonably well into phase three of the model (Level 3, high involvement). Respondents were asked to indicate the year their school system joined a network. Of the total number of respondents, 82.3% provided the date they first joined a network as well as the level of their involvement. For this study, those joining before 1980 were classified as early adopters and labeled "Over 10 years"; those joining between 1980 and 1985 are labeled "6-10 years", and those joining since 1985 are labeled "5 and under." Using chi-square, the relationship between the level of involvement and when the school system adopted networking was statistically significant at the .05 level (p=.000). Table 4.18 provides the number and percents.

TABLE 4.20

TEST OF SIGNIFICANCE:

YEARS SINCE ADOPTION AND LEVEL OF INVOLVEMENT

	INVOLVEMENT							
	Level 1		Level 2		Level 3		Total	
	n	%	n	%	n	%	n	%
5 & under years	53	(20.7)	18	(7.0)	22	(8.6)	80	(31.3)
6-10 years	42	(16.4)	22	(8.6)	19	(7.4)	93	(32.4)
Over 10 years	21	(8.2)	37	(14.4)	22	(8.6)	83	(36.3)
Total	116	(45.3)	77	(30.1)	63	(24.6)	256	

Chi-square = 20.995; df = 4
p=.000 *, gamma coef.=-0.203
(* significant at p<.05)

It appears that there is, indeed, a strong relationship between the years since adoption of networking and the level of involvement.

Chapter 5. CONCLUSIONS

Summary

This study began with a reminder of a basic principle of American librarianship that each individual has the right of equal opportunity to access information to meet his or her needs. School students are included in this basic right, although individual school library media centers are limited in their ability to realize this right because of the small size of their resources. However, through resource sharing in library networks, the school can access a broader range of information resources. While cooperation among libraries has been accepted for many years, schools have become active in library networks only recently. This study has explored certain aspects of school library membership activities in these networks.

A preliminary model of the stages of school system participation in library networks was developed with the major activities for each stage identified. The model follows the stages in the innovation adoption and diffusion literature and is constructed from the study of the literature, observation, and informal interviews. The model is composed of four primary aspects: technological support, financial support, human support, and activities and

applications. Within each aspect, anticipated events in each of the three stages of participation in a network were identified. The detailed model is described in Chapter 3 and is summarized in Figure 5.1.

Anticipated events from each aspect were used in the construction of the questionnaire which was sent to a random sample of school systems in one or more of three types of networks. Network structures used in this study were multitype regional or state, state-wide school, and OCLC affiliates.

FIGURE 5.1

SUMMARY OF THE

SCHOOL LIBRARY NETWORKING MODEL

		Phase I	Phase II	Phase III
	TECHNOLOGY			
*	Telephone	None	Some	Extensive
*	Micro-computers	None	Some	Extensive
*	Telecom-munications	None	Some	Extensive
	FINANCIAL SUPPORT			
	Interlibrary loan	None	Some	Extensive
	Network Dues	None	Some	Extensive
*	Activities	None	Some	Extensive
	HUMAN SUPPORT			
*	Meetings	Informal	Formal	Organization
	Interlibrary loan	Casual	Formal	Electronic
*	Policies	None	In progress	Adopted
*	External resources	Awareness	Exploration	Use
*	Staff	No additions	Requested	Added
*	System level support	Little	Some	Extensive
	ACTIVITIES AND APPLICATIONS			
*	Serials	Lists	Union list	Union catalog
*	Special Collections	Awareness	Exploration	Use
*	Collection development	Awareness	Exploration	Use
*	Cooperative technical services	Awareness	Exploration	Use
*	Delivery methods	Awareness	Exploration	Use
	Teach use of external resources	Awareness	Exploration	Use

* significant for $p<.05$

Discussion

The Model

Four aspects were identified for inclusion in the model: technological support, financial support, human support, and activities and applications.

(1) TECHNOLOGICAL SUPPORT. It was expected that the need for a telephone in the school library media center would be a priority for participation in resource sharing. At the simplest level a telephone can be used for interlibrary loan telephone requests. At a more involved level it can be used for interlibrary loan requests via computer and searching of online databases. This study confirmed the importance of a telephone in the media center. The availability of a telephone elsewhere in the school is not sufficient.

Microcomputers as a commonplace technology began to be used less than fifteen years ago. Thus, for early adopters of network membership, having a microcomputer was not a factor. Since then, because the cost of microcomputers has declined and their power has increased, school library media specialists in the study called the microcomputer "an addition to their staff."

It has been shown that activities involving the combination of a telephone, microcomputers, and the use of

telecommunications are indeed significant to full network participation. As a natural enhancement to a microcomputer and a way to combine the technologies of the telephone and microcomputers, a modem can provide the link to external resources. The telephone is again identified here as a means to access electronic bulletin boards and online services demonstrating a new use of an old technology. Other uses of technology may be significant that were not addressed in this study.

(2) FINANCIAL SUPPORT. The model specified three specific services for which financial support would be required. Only one, funding for network activities, tested as significant. The fact that the other elements were not seen as significant could be explained by the structure of the networks used in this study. Funding for multitype networks and school state-wide networks has come from the state level, primarily as the result of legislative action to encourage cooperation. With this source of funding, no dues are assessed from individual school systems, therefore no funding for dues is budgeted by the school systems. The cost of interlibrary loan requests is absorbed by the telephone budget. The cost of the delivery of interlibrary loan materials is absorbed by either the postage budget or the regular school system delivery service. The model

tested here does not take into account financial support from other sources.

(3) HUMAN SUPPORT. All the factors in the human support aspect of the model tested as significant. The gamma tests show strength of association of 0.442 to 0.447 regarding local activities such as informal meetings of local librarians and the development of local policies for resource sharing. A formal local organization and the provision for additional staff to deal with the increased interlibrary loan service, although significant, had low measures of association (0.125 to 0.297). Perhaps in states with no legislated funding, the local organization becomes more important because efforts to form networks would necessarily emerge from the local level.

(4) ACTIVITIES AND APPLICATIONS. Since networking implies action, seven activities were selected as possible services for cooperation for inclusion in the model. Of these seven, six were significant at the .05 level and one at the .10 level. Exchange of information of a library's holdings in print and eventually in electronic form appears to be a strong beginning for networking. This type of exchange is a natural outgrowth of human support, beginning with informal meetings and developing into a local

organization with written policies and procedures for cooperative activities and resource sharing.

Additional Parameters

(1) TYPE OF NETWORK. When the tests were performed using school network and OCLC network membership on each event, eleven of the nineteen events were significant, illustrating the differences in legislated participation versus elected participation in a network.

(2) POSITION OF RESPONDENT. Over 50% of the respondents were in building level positions; however, differences in the significance of the events in the study were slight. It appears that whether the school library contact person is on the system level or on the building level, the aspects and events are nearly the same.

(3) SIZE OF SCHOOL SYSTEM. Only 5 of the 19 events revealed differences based on the size of the school system. All school systems are finding a need to extend services by resource sharing and cooperation with other libraries. Perhaps larger school systems emphasize the placement of telephones in media centers more so than do smaller, usually rural, school systems. It appears that the size of the school system is a significant factor in such activities as the exchange of serials lists and the formation of a union list of serials. Perhaps small schools, with limited

budgets, share holdings information to provide access to additional resources.

(4) YEARS SINCE ADOPTION. The number of years a school system has been a member of a network made little difference in the ratings of the significance of the events in the study. One test was done on the level of involvement and the years since the respondent had joined a network. This relationship was significant (p=.000). Over two-fi hs of the respondents were at the first level of involvement, and of these, half had been a network member for five years or less.

Applications

The model developed through this study serves three purposes: (1) to inform, (2) to guide, and (3) to encourage. The first stage of the adoption-decision process is knowledge. It is hoped that this model will inform, not only school librarians, but also others in the educational arena. Superintendents and other system level administrators need to be knowledgeable about innovations, especially the potential benefits from resource sharing in library networks. The model can serve as a guide to understanding the process by which school systems participate in networ-.

Secondly, the model will serve as a guide to planning

and implementing network membership. By identifying where they fit in the model, a school system can determine the elements that need to be addressed in short- and long-range planning.

Thirdly, the model will provide encouragement to school library media specialists who want to provide the best possible program for their students with access to materials outside the school building. The model identifies the phases and activities that lead toward full participation.

Implications

The 3,613 school systems forming the population for this study represent nearly 90% of all the school systems identified in the literature as being members of some type of library cooperative. The results of a similar study that includes members of all types of networks should not differ greatly from the results presented in this study. However interesting differences may be found when responses are analyzed by type of network.

One expected difference is involves financial support which, in this study, was deemed highly important for both state-regional networks and for school state-wide networks. In two types of networks not included in this study, the Western Library Network (WLN) and local networks, the

financial support for school system networking must be received from local sources. Written statements of justification for membership and resource sharing must be prepared and presented to the financial officers of the school systems and governmental bodies. The model provided here may contribute to the justification required by media services supervisors and media specialists for full participation in a network.

One area not specifically addressed in this study concerns the qualifications of the school media specialists. Clearly the educational background of the media professional must include knowledge about the structure and nature of networks as well as the technological skills to participate effectively. There are implications here for the education of media specialists, both for first professional degree programs and for continuing education for those whose preparation did not include information about networking and current technologies in use. Since the media program in a school is usually directed by one and sometimes two professionals, those professionals must receive preparation, not only in teaching and in the operations of a media center, but also in the use of technology for resource sharing.

Articles about evaluation of school media programs in terms of their participation in networks is beginning to appear in the literature. Studies examining the citations in research papers and student use of online services have been reported by Craver (1985), Callison (1988), Mancall (1988), Kuhlthau (1989), Clise (1990) and others. In the development of meaningful research assignments, the focus is shifting from the number of references to the content of references located online. Under the guidance of the teacher and media specialist students need to spend their time reading and writing instead of searching in several libraries to locate relevant articles. Such a philosophy is evolving as schools progress through the stages using telecommunications with technological support. Collection development strategies in schools and in school systems are being adjusted to meet the requests of students using online searching for relevant materials to support their research. (Minnich, 1990)

Recommendations

Research concerning school participation in library networks has been limited to studies of specific networks or in specific states. This study was designed to examine a broader national picture of the diffusion of networking in school systems.

Although the model addresses four aspects and nineteen factors and events, the activities identified for this study are not comprehensive. Further studies need to be undertaken to explore other cooperative activities, such as consolidated purchasing, joint staff development programs, and shared staffing. One respondent wrote, "By being affiliated with [the network], we can get materials needed for projects at a reduced cost, and quicker."

One of the main elements in the diffusion of innovations is time. (Rogers, 1983) Case studies need to be done on the rate of development towards full participation in a network using levels I, II and III of the model as criteria. Does a school system's adoption of network participation follow the same curve as described by Rogers whereby early adopters take longer to pass from phase to phase than do late adopters? Does the rate of adoption of networking activities by school systems differ from that of public, academic, or special libraries?

Another test of the model would be to ask respondents to indicate on the model the level of each activity at a point in time. By examining these indicators, patterns could be identified which would further confirm the stages of the model.

Rogers (1983) discussed the consequences of innovations and Lunardi (1987) recognized the need to evaluate the effects of network membership on the school library program. Following these leads, case studies in which interviews are conducted before the school system joins a network and then over a period of years would provide a picture of the changes that take place as a result of network membership. Particular questions to be addressed include what are the advantages and disadvantages of network participation? Are school system administrators, as well as librarians, staff members, and patrons advised of these before entering into a network? Are the network members, including the library patrons, informed of the advantages and disadvantages of school participation?

Replication of the study could be done using school systems in local and community networks, WLN, and other network structures. Comparisons between those findings and the findings of this study would be valuable.

This study has addressed only school library participation. The 1986 study of networking by Griffith, Havelock, and Sweets excluded schools. Additional comparative research on the adoption process of network participation of libraries should be conducted to include

school libraries. How would a model of the adoption process of public, special or academic libraries compare to that of school libraries? Could one model serve all types of libraries?

Barriers to school participation in library networking were identified in 1969 and have been investigated by several studies since that time. (Nolting, 1969; NCLIS, 1978; Immroth, 1980; Woolls, 1985; Partridge, 1988.) Other studies have focused on the contributions of school libraries to multitype library networks (Falsone, 1977; Greenberg, 1981; Sorenson, 1984) and on the status of barriers to network participation in particular states (Weeks, 1982; Lunardi, 1987; Partridge, 1989). What is the status across the nation of the barriers? Which barriers are no longer a problem? Have other factors been identified as barriers?

Diffusion literature addresses the leadership qualities of the participants. (Sorenson, 1984; Huberman and Miles, 1984; Griffiths, Havelock and Sweets, 1986) Future study could be undertaken to investigate the personality variables of those who have influenced school system participation in library network. These variables might include position in the school system (building level, system level general administrator, or media services supervisor), educational

background, participation in professional organizations, leadership style, and attitude towards risk taking.

Significance

The goal of this study was to develop and test a model that describes the process whereby school systems become participants in networks. As do other models, this one provides a guide for users to assess their own progress in adoption of an innovation and to plan for positive action. It provides empirical data for researchers on the status of networking activity and suggests ways to further investigations that will deepen our understanding. It is hoped that this contribution to librarianship will provide information, guidance, and encouragement to librarians entering the adoption process and researchers studying the networking phenomenon.

APPENDIX A

INSTRUMENTS

THE UNIVERSITY OF NORTH CAROLINA
AT
CHAPEL HILL

School of Information and Library Science

CB# 3360, 100 Manning Hall
The University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3360

October 6, 1989

Dear Media Coordinator/Supervisor:

A current issue in the library profession concerns library networks and the proper role of school libraries in such networks. It is not clear how extensive the involvement of school libraries in networks is. For example, if one school in a district participates, do all schools? Are schools networking through electronic means? by telephone? A model describing the evolution of schools' participation in networks is being developed.

Your school was selected from the population of schools identified as being members of library cooperatives. The enclosed questionnaire should take you no more than twenty minutes to complete. It asks for information about your school district's experience in networking and events leading toward it. To assure that the results accurately reflect the situation for all school libraries, it is important that this questionnaire be completed and returned.

Your response will be treated as confidential, and the data will be reported in aggregate form only. A self-addressed stamped envelope is provided for your convenience in returning the questionnaire.

We believe the results of the study will provide useful information for the field as a whole and valuable insights into the use of networks by school libraries. Results will be submitted for publication in professional journals and presented at professional meetings.

Thank you for your assistance.

Sincerely yours,

Diane D. Kester, Lecturer
Department of Library &
Information Studies
East Carolina University

Evelyn Daniel, Dean
School of Information &
Library Science
University of North Carolina
at Chapel Hill

SCHOOL LIBRARIES IN LIBRARY NETWORKS

The following information is essential to identify the extent of school library membership in library networks.

Name of school district: _____

What is the enrollment of your school district? _____

How many schools are in your district? _____

SECONDARY* _____ ELEMENTARY+ _____ OTHER _____

Is your district a participating member of a library/network organization?

_____ YES _____ NO

How many schools in your district participate in the library network?

SECONDARY* _____ ELEMENTARY+ _____ OTHER _____

In which library/network organization(s) does your district participate?

OCLC affiliate
(i.e., AMIGO, NELINET, SOLINET)

Name: _____

Year joined: _____

State multitype library network (may have regional divisions, i.e., a Regional Library Service System, an Area Library Services Authority, Library Cooperative)

Name: _____

Year joined: _____

State school cooperative (may have regional divisions)
(i.e., REMC, BOCES):

Name: _____

Year joined: _____

Other

Name: _____

Year joined: _____

* Schools in which the lowest grade taught is greater than sixth grade and the highest grade taught is greater than seventh.
+ Schools in which the lowest grade taught is less than fourth grade and the highest grade taught is less than ninth grade.

How involved in these network/ organization(s) do you consider your school district?

NOT INVOLVED — INTENSIVELY INVOLVED

0 — 1 — 2 — 3 — 4

Certain conditions have been identified as factors that encourage school libraries to join with other libraries to provide service to patrons. For your school district, which of the following factors were important to your participation, and what weight would you give them?

For each, mark the line of significance with 0 being NOT A FACTOR and 4 being HIGHLY SIGNIFICANT and indicate the length of time each have been available in at least one school.

TECHNOLOGICAL FACTORS

1. Telephone in the library media center?

NOT A FACTOR — HIGHLY SIGNIFICANT

0 — 1 — 2 — 3 — 4

Number of years available: _____

2. Use of a microcomputer for library/media center management:

NOT A FACTOR — HIGHLY SIGNIFICANT

0 — 1 — 2 — 3 — 4

Number of years available: _____

** How long has the microcomputer been used for the following functions?

Word processing: _____ years

Overdues: _____ years

Acquisitions (i.e., consideration file, ordering, etc.): _____ years

Cataloging (i.e., card preparation): _____ years

Inventory: _____ years

Circulation: _____ years

Budgeting: _____ years

Interlibrary loan: _____ years

CD-ROM reference: _____ years

Other (please describe):

3. Telecommunications: (e.g., computer with modem, access to online bulletin board, electronic mail, database vendors):

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

FINANCIAL SUPPORT

4. Funds for ILL (interlibrary loan) in budget:

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

5. Funds for network membership dues:

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

6. Funds for network activities (e.g., telefacsimile, conferences, travel, etc.):

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

HUMAN SUPPORT

7. Scheduled meetings with librarians of other types of libraries:

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

8. Interlibrary loan written policies:

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

9. Local librarian organization with by-laws and regulations for cooperative endeavors:

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

10. School access to external resources (e.g., union catalog, online database vendors, etc.):

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

11. Staff support since network membership: (additional staff needs met)

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

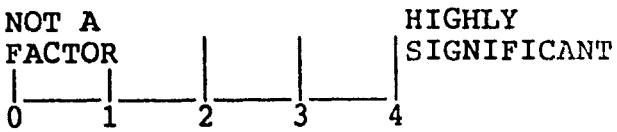
12. System level support:

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

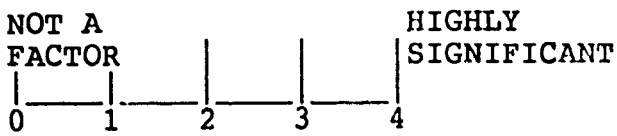
ACTIVITIES and APPLICATIONS

13. Exchange of serials holding lists with other libraries:



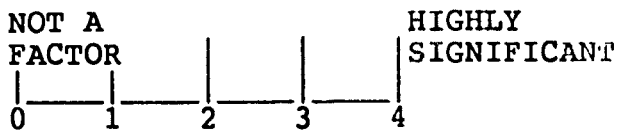
Number of years available: _____

14. Formation of union catalog of serials:



Number of years available: _____

15. Exchange of special collections information:

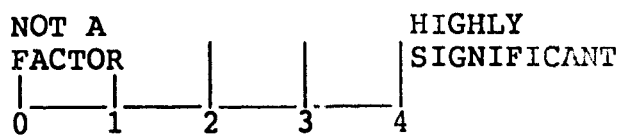


Number of years available: _____

16. Cooperative collection development:

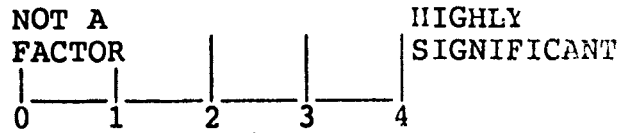
Number of years available: _____

17. Cooperative technical services:



Number of years available: _____

18. Materials delivery system:



Number of years available: _____

19. Use of external resources taught as a reference skill:

NOT A FACTOR 0 1 2 3 4 HIGHLY SIGNIFICANT

Number of years available: _____

Remarks:

Position/title of person completing this questionnaire:
(e.g., Assistant Superintendent for Instruction, Library/Media Services Director, High School Media Specialist)

Your contribution to this effort is very greatly appreciated. Thank you for your time and participation.

A return address envelope has been enclosed for your convenience.

Diane D. Kester
105 Longview Drive
Goldsboro, NC 27534

FOLLOW-UP POSTCARD

105 Longview Drive
Goldsboro, NC 27534
November 6, 1989

Dear Media Coordinator/Supervisor:

Thank you for participating in the survey concerning school libraries in library networks. Your experiences will contribute to the model being developed.

If you have not yet completed and returned the questionnaire, I sincerely hope you will do so soon. If another copy is needed, please call 919-778-2821 collect or leave a message on the answering machine.

Results will be tabulated later this month and I hope to be able to include your responses.

Sincerely yours,

Diane D. Kester

EAST CAROLINA UNIVERSITY
GREENVILLE, NORTH CAROLINA 27858-4353

DEPARTMENT OF LIBRARY
& INFORMATION STUDIES

Telephone 919 757-6621

Fax 919-757-0078

COVER LETTER FOR THIRD MAILING

January 12, 1990

Dear Colleague:

Enclosed is a copy of the questionnaire which was mailed to your school district in October. It is extremely important for the study that I receive some response from you. If your school district is not participating in a library network or cooperative, please indicate such on page 2 of the questionnaire, slip it into the enclosed self-addressed stamped envelope, and return it.

If you do participate, at a minimum, please respond to how involved in the network your school district is (the first question on page 3); and mark how significant each factor is to your participation. Your response will be treated as confidential, and the data will be reported in aggregate form only.

I am sure you understar' he importance of research in our profession. Thank you for your prompt reply.

Sincerely yours,

Diane D. Kester, Lecturer
Department of Library &
Information Studies
East Carolina University

APPENDIX B

NETWORK GROUPS

POPULATION OF SCHOOLS IN

OCLC, MULTITYPE REGIONAL/STATE, AND/OR SCHOOL NETWORKS
1988

	School Systems	Total School Systems
CALIFORNIA		37
49-99 Coop. Lib. Sys	1	
AWLNET	10	
SIRCULS - Inland Library System	20	
TIE	6	
COLORADO		
all in Reg. Lib. Serv. Sys.	177	177
CONNECTICUT		
all in Reg. Lib. Councils	149	149
ILLINOIS		557
Chicago Library System	2	
Corn Belt Library System	15	
Bur Oak Library System	16	
Cumberland Trail Library System	39	
Dupage Library System	42	
Great River Library System	41	
Illinois Valley Library System	15	
Kaskaskia Library System	54	
Lewis & Clark Library System	38	
Lincoln Trail Libraries	26	
North Suburban Library System	59	
Northern Illinois Library System	32	
River Bend Library System	11	
Rolling Prairie Library System	57	
Shawnee Library System	59	
Suburban Library System	17	
Western Illinois Library System	34	

INDIANA		267
ALSA 2	27	
Central Indiana ALSA	23	
Eastern Indiana ALSA	37	
Four Rivers ALSA	19	
Northwest Indiana ALSA	33	
Southeastern Indiana ALSA	38	
Stone Hills ALSA	26	
Tri-ALSA	33	
Wabash Valley ALSA	31	
KANSAS		113
Central Kansas Library System	2	
Kansas City Metro Library Network	1	
Northwest Kansas Library System	6	
South Central Kansas Library System	40	
Southeast Kansas Library System	41	
Southwest Kansas Library System	23	
MICHIGAN		493
Capital Area Lib. Network	19	
Lakeland Area Lib Network	52	
Macomb Region of Cooperation	21	
Mid-Michigan League Region		
Traverse Bay Area (REMC 2)		
REMC 6	13	
Soo Area International Library		
Northland Library Cooperative		
Southwest Michigan Lib Coop.		
Upper Peninsula Interlib. Network		
Washtenaw-Livingston Lib. Network	14	
Wayne Oakland Lib Fed.	6	
White Pine Library Cooperative		
Woodlands Library Cooperative	39	
MINNESOTA		358
MINITEX - Minn. Dept. of Ed.		
Central Minnesota Lib Ex.	80	
Metronet	49	
North Country Library Cooperative	34	
Northern Lights Library Network	92	
Southcentral Minnesota Interlib.	46	
Southeast Library System	32	
Southwest Area Multi-county Mul.	20	
Weseca Interlibrary Resource Exc.	5	

MISSOURI		80
Kansas City Metropolitan Lib. Sys.	1	
Mid-Missouri Library Network	4	
Northeast Missouri Library Network	25	
Northwest Missouri Library Network	2	
St. Louis Regional Library Network	25	
Southeast Missouri Library Network	18	
Southwest Missouri Library Network	5	
NEBRASKA		298
NEBASE - OCLC - Omaha Public School	1	
Eastern Library System	26	
Northeast Library System	80	
Southeast Library System	62	
Meridian Library System		
Panhandle Library System		
Republican Valley Library System		
NEW JERSEY		350
Regional Library Coop.-Lawrenceville	24	
Regional Library Coop.-Jersey City		
Regional Lib. Coop.-Bergenfield		
Libraries Unlimited - Sewell		
Union/Middlesex Regional Lib.Coop.		
NEW YORK		664
Capital District Library Co. for RRR	72	
Albany-Schoharie-Sch BOCES SLS		
Hamilton-Fulton-Mont. BOCES SLS		
Saratog-Warren Co. BOCES SLS		
Wash.-War-Ham.-Essex BOCES SLS		
Central NY Lib. Res Council	58	
Herk-Fult-Ham.-Oteg BOCES SLS		
Madison-Oneida BOCES SLS		
Oneida Co.SLS		
Onondaga-Cortland-Mad. BOCES SLS		
Syracuse City SLS		
Long Island LRC	99	
Nassau SLS		
Suffolk 1 BOCES SLS		
Suffolk 2 BOCES SLS		
Suffolk 3 BOCES SLS		

NY Metropolitan RR (METRO) 46
NYC SLS
Putt-North Westc. BOCES SLS
So. Westchester BOCES SLS
Yonkers SLS

North Country RRR 72
Clin-Essex-Warr-Wash BOCES SLS
Franklin-Essex-Ham BOCES SLS
Jeff-Lewis-Ham-Herk-One BOCES SLS
Oswego Co. SLS
St. Lawrence-Lewis BOCES SLS

Rochester RR LC 57
Living.-Steuben-Wyom BOCES SLS
Monroe 1 BOCES SLS
Monroe 2-Orleans BOCEs SLS
Rochester SLS
Wayne-Finger Lakes BOCES SLS

South Central Res Lib. Council 94
Broome-Del.-Tioga BOCES SLS
Cayugo-Onondaga BOCEs SLS
Del.-Cheno-Mad-Otsego BOCES SLS
Ots-No. Catskills BOCES SLS
Schuyler-Chemung-Tioga BOCEs SLS
Steuben-Allegany BOCES SLS
Tompkins-Seneca-Tioga BOCES SLS

Southeastern NY Lib Res Council 76
Dutchess SLS
Orange-Ulster BOCES SLS
Rens.-Col.-Greene BOCES SLS
Rockland Co. SLS
Sullivan BOCEs SLS
Ulster Co. BOCES SLS

Western NY Lib Res Council 90
Buffalo SLS
Catt. Aleg-Erie-Wyo. BOCES SLS
Chaut. Co. SLS
Erie 1 BOCES SLS
Erie-Catt 2 BOCES SLS
Genessee-Wyo. BOCES SLS
Orleans-Niagara BOCES SLS

NORTH CAROLINA
SOLINET 2

OHIO
OHIONET 2

PENNSYLVANIA		3
TEXAS		
AMIGOS		1
WISCONSIN		62
North East Wis. Intertype Libraries	20	
Fox Valley Library Council	18	
Northern Waters Library Service -	informal	
Multitype Comm. of Rock Co.	9	
Lib. Council of Metro. Milwaukee	5	
Madison Area Lib. Council -	some	
Mid-Wisc. Lib Asso. -	some	
Wisc. Valley Lib. Serv.	10	
Eastern Shores Lib. Sys -	informal	
	====	=====
		3,613
Number in sample		674

SCHOOLS SERVICED BY OCLC VENDORS

	Sch.Sys.	State Total
ILLINOIS		557
ILLINET		
Bur Oak Library System	16	
Chicago Library System	2	
Corn Belt Library System	15	
Cumberland Trail Library System	39	
Dupage Library System	42	
Great River Library System	41	
Illinois Valley Library System	15	
Kaskaskia Library System	54	
Lewis & Clark Library System	38	
Lincoln Trail Libraries	26	
North Suburban Library System	59	
Northern Illinois Library System	32	
River Bend Library System	11	
Rolling Prairie Lib. System	57	
Shawnee Library System	59	
Suburban Library System	17	
Western Illinois Library System	34	
MICHIGAN		61
MLC-Michigan Library Consortium		
REMC 1 - Copper Country Inter.	2	
REMC 2 - Traverse Bay Area ISD	6	
REMC 3 - Cheboygan-Otsego-Presq	3	
REMC 4 - Muskegon ISD	3	
REMC 5 - Clare-Gladwin ISD	3	
REMC 6 - Bay-Arenac Co. ISD	2	
REMC 7 - Ottawa; Allegan Co.	2	
REMC 8 - Kent ISD	3	
REMC 9 - Saginaw Co. ISD	1	
REMC 10 - Tuscola Co. ISD	3	
REMC 11 - Van Buren; Lewis Cass	3	
REMC 12 - Kalamazoo Valley	5	
REMC 13 - Ingham ISD	3	
REMC 14 - Genesee ISD	3	
REMC 15 - Jackson Co.	2	
REMC 16 - Washtenaw ISD	2	
REMC 17 - Oakland Co. ISD	1	
REMC 18 - Macomb ISD	2	
REMC 19 - Monroe Co.	2	
REMC 20 - Wayne Co. ISD	5	

REMC 21 - Marquette-Alger ISD	4	
REMC 22 - Eastern Upper Peninsula	1	
MINNESOTA		318
MINITEX - Minn. Dept. of Ed.		
Central Minnesota Library Exc.	80	
Metronet	26	
North County Library Cooperative	29	
Northern Lights Library Network	92	
Southcentral Minnesota Interlib.	46	
Southeast Library System	25	
Southwest Area Multi-county Mul.	20	
NEBRASKA		3
NEBASE - OCLC		
NEW HAMPSHIRE		60
Library Development System	60	
NORTH CAROLINA		2
SOLINET	2	
OHIO		2
OHIONET	2	
PENNSYLVANIA		3
PALINET	3	
TEXAS		1
AMIGOS	1	
		1,007

SCHOOLS IN STATES WITH REGIONAL MULTITYPE NETWORKS

	Sch.Sys.	State Total
CALIFORNIA		40
AWLNET	10	
CAL	1	
CLASS	3	
SCAN	0	
SERRA Cooperative Library Sys.	0	
SIRCULS - Inland Library System	20	
TIE	6	
COLORADO - Regional Library Service Systems		173
Arkansas Valley RLSS	35	
Central Colorado RLSS	17	
High Plains RLSS	38	
Pathfinder RLSS	13	
Plains and Peaks RLSS	31	
Three Rivers RLSS	18	
Southwest RLSS	21	
CONNECTICUT		139
Capitol Region Library Council	21	
Eastern Conn. Lib. Assoc.	26	
Region One Cooperative Library	36	
Southeastern Conn. Library	3	
Southern Conn. Lib. Coop.	32	
Southwestern Conn. Lib. Coop.	21	
ILLINOIS		557
Bur Oak Library System	16	
Chicago Library System	2	
Corn Belt Library System	15	
Cumberland Trail Library System	39	
Dupage Library System	42	
Great River Library System	41	
Illinois Valley Library System	15	
Kaskaskia Library System	54	
Lewis & Clark Library System	38	
Lincoln Trail Libraries	26	
North Suburban Library System	59	
Northern Illinois Library System	32	
River Bend Library System	11	
Rolling Prairie Lib. System	57	
Shawnee Library System	59	
Suburban Library System	17	
Western Illinois Library System	34	

INDIANA		267
ALSA 2	27	
Central Indiana ALSA	23	
Eastern Indiana ALSA	37	
Four Rivers ALSA	19	
Northwest Indiana ALSA	33	
Southeastern Indiana ALSA	38	
Stone Hills ALSA	26	
Tri-ALSA	33	
Wabash Valley ALSA	31	
KANSAS - Library Systems		113
Central Kansas LS	2	
Kansas City Metro Library Network	1	
Northwest Kansas LS	6	
South Central Kansas LS	40	
Southeast Kansas LS	41	
Southwest Kansas LS	23	
MICHIGAN		
Capital Area Lib. Network	18	
Lakeland Area Library Network	2	
Macomb Region of Cooperation	21	
Mid-Michigan League Region		
Soo Area International Library		
Northland Library Cooperative		
Southwest Michigan Library Coop.	21	
Upper Peninsula Interlib. Network		
Washtenaw-Livingston Lib. Network	0	
Wayne Oakland Library Federation		
White Pine Library Cooperative	13	
Woodlands Library Cooperative	55	
MINNESOTA		300
MINITEX - Minn. Dept. of Ed.		
Metronet	28	
North County Library Cooperative	34	
Northern Lights Library Network	92	
Southcentral Minnesota Interlib.	46	
Southeast Library System	26	
Southwest Area Multi-county Mul.	70	
Weseca Interlibrary Resource Exc.	4	

MISSOURI		80
Kansas City Metro. Lib. Sys.	1	
Mid-Missouri Library Network	4	
Northeast Missouri Lib. Network	25	
Northwest Missouri Lib. Network	2	
St. Louis Regional Lib. Network	25	
Southeast Missouri Lib. Network	18	
Southwest Missouri Lib. Network	5	
NEBRASKA		108
Eastern Library System	26	
Northeast Library System	20	
Southeast Library System	62	
Meridian Library System		
Panhandle Library System		
Republican Valley Library System		
NEW JERSEY		24
Regional Library Coop. Reg.5 Lawrenceville	24	
Regional Library Coop.-Jersey City		
Regional Lib. Coop.-Bergenfield		
Libraries Unlimited - Sewell		
NEW YORK	664	
Capital District Library Co. RRR	72	
Albany-Schoharie-Sch BOCES SLS		
Hamilton-Fulton-Mont. BOCES SLS		
Saratoga-Warren Co. BOCES SLS		
Wash.-War-Ham.-Essex BOCES SLS		
Central NY Lib. Res Council	58	
Herk-Fult-Ham.-Oteg BOCES SLS		
Madison-Oneida BOCES SLS		
Oneida Co.SLS		
Onondaga-Cortland-Mad. BOCES SLS		
Syracuse City SLS		
Long Island LRC	99	
Nassau SLS		
Suffolk 1 BOCES SLS		
Suffolk 2 BOCES SLS		
Suffolk 3 BOCES SLS		
NY Metropolitan RR (METRO)	46	
NYC SLS		
Put-North Westc. BOCES SLS		
So. Westchester BOCES SLS		
Yonkers SLS		

North Country RRR	72	
Clin-Essex-Warr-Wash BOCES SLS		
Franklin-Essex-Ham BOCES SLS		
Jeff-Lewis-Ham-Herk-One BOCES SLS		
Oswego Co. SLS		
St. Lawrence-Lewis BOCES SLS		
Rochester RR LC	57	
Living.-Steuben-Wyom BOCES SLS		
Monroe 1 BOCES SLS		
Monroe 2-Orleans BOCES SLS		
Rochester SLS		
Wayne-Finger Lakes BOCES SLS		
South Central Lib. Res. Council	94	
Broome-Del.-Tioga BOCES SLS		
Cayugo-Onondaga BOCES SLS		
Del.-Cheno-Mad-Otsego BOCES SLS		
Ots-No. Catskills BOCES SLS		
Schuyler-Chemung-Tioga BOCES SLS		
Steuben-Allegany BOCES SLS		
Tompkins-Seneca-Tioga BOCES SLS		
Southeastern NY Lib Res Council	76	
Dutchess SLS		
Orange-Ulster BOCES SLS		
Rens.-Col.-Greene BOCES SLS		
Rockland Co. SLS		
Sullivan BOCES SLS		
Ulster Co. BOCES SLS		
Western NY Lib Res Council	90	
Buffalo SLS		
Catt. Aleg-Erie-Wyo. BOCES SLS		
Chaut. Co. SLS		
Erie 1 BOCES SLS		
Erie-Catt 2 BOCES SLS		
Genessee-Wyo. BOCES SLS		
Orleans-Niagara BOCES SLS		
WISCONSIN		62
North East Wis. Intertype Libs	20	
Fox Valley Library Council	18	
Northern Waters Library Service	0	
Multitype Comm. of Rock Co.	9	
Lib. Council of Metro. Milwaukee	5	
Madison Area Library Council	some	
Mid-Wisc. Library Association	some	
Wisc. Valley Library Serv.	10	
Eastern Shores Lib. Sys - Informal		
		2,588

SINGLE TYPE SCHOOL/LIBRARY COOPERATIVES

	Sch.Sys.	State Total
MICHIGAN		61
MLC-Michigan Library Consortium		
REMC 1 - Copper Country Intermediate SD	2	
REMC 2 - Traverse Bay Area ISD	6	
REMC 3 - Cheboygan-Otsego-Presq	3	
REMC 4 - Muskegon ISD	3	
REMC 5 - Clare-Gladwin ISD	3	
REMC 6 - Bay-Arenac Co. ISD	2	
REMC 7 - Ottawa; Allegan Co.	2	
REMC 8 - Kent ISD	3	
REMC 9 - Saginaw Co. ISD	1	
REMC 10 - Tuscola Co. ISD	3	
REMC 11 - Van Buren; Lewis Cass, B	3	
REMC 12 - Kalamazoo Valley	5	
REMC 13 - Ingham ISD	3	
REMC 14 - Genesee ISD	3	
REMC 15 - Jackson Co.	2	
REMC 16 - Washtenaw ISD	2	
REMC 17 - Oakland Co. ISD	1	
REMC 18 - Macomb ISD	2	
REMC 19 - Monroe Co.	2	
REMC 20 - Wayne Co. ISD	5	
REMC 21 - Marquette-Alger ISD	4	
REMC 22 - Eastern Upper Peninsula	1	
The above are included in one of these below.		
Capital Area Lib. Network		18
Lakeland Area Library Network (REMC 7)		2
Macomb Region of Cooperation		21
Mid-Michigan League Region		
Soo Area International Library		
Northland Library Cooperative		
Southwest Michigan Library Cooperative		21
Upper Peninsula Interlib. NW		
Washtenaw-Livingston Lib. NW		0
Wayne Oakland Library Federation		
White Pine Library Cooperative		13
Woodlands Library Cooperative (No ILL)		55

MINNESOTA		381
MINITEX - Minn. Dept. of Ed.		
Central Minnesota Library Cooperative	80	
Metronet	26	
North County Library Cooperative	92	
Northern Lights Library NW	92	
Southcentral Minnesota Interlib.	46	
Southeast Library System	25	
Southwest Area Multi-county Mul.	20	
NEW YORK		664
Capital District Library Co. for RRR	72	
Albany-Schoharie-Sch BOCES SLS		
Hamilton-Fulton-Mont. BOCES SLS		
Saratoga-Warren Co. BOCES SLS		
Wash.-War-Ham.-Essex BOCES SLS		
Central NY Lib. Res Council	58	
Herk-Fult-Ham.-Oteg BOCES SLS		
Madison-Oneida BOCES SLS		
Oneida Co.SLS		
Onondaga-Cortland-Mad. BOCES SLS		
Syracuse City SLS		
Long Island LRC	99	
Nassau SLS		
Suffolk 1 BOCES SLS		
Suffolk 2 BOCES SLS		
Suffolk 3 BOCES SLS		
NY Metropolitan RR (METRO)	46	
NYC SLS		
Putt-North Westc. BOCES SLS		
So. Westchester BOCES SLS		
Yonkers SLS		
North Country RRR	72	
Clin-Essex-Warr-Wash BOCES SLS		
Franklin-Essex-Ham BOCES SLS		
Jeff-Lewis-Ham-Herk-One BOCES SLS		
Oswego Co. SLS		
St. Lawrence-Lewis BOCES SLS		
Rochester RR LC	57	
Living.-Steuben-Wyom BOCES SLS		
Monroe 1 BOCES SLS		
Monroe 2-Orleans BOCES SLS		
Rochester SLS		
Wayne-Finger Lakes BOCES SLS		

South Central Res Lib. Council	94
Broome-Del.-Tioga BOCES SLS	
Cayugo-Onondaga BOCES SLS	
Del.-Cheno-Mad-Otsego BOCES SLS	
Ots-No. Catskills BOCES SLS	
Schuyler-Chemung-Tioga BOCES SLS	
Steuben-Allegany BOCES SLS	
Tompkins-Seneca-Tioga BOCES SLS	
Southeastern NY Lib Res Council	76
Dutchess SLS	
Orange-Ulster BOCES SLS	
Rens.-Col.-Greene BOCES SLS	
Rockland Co. SLS	
Sullivan BOCES SLS	
Ulster Co. BOCES SLS	
Western NY Lib Res Council	90
Buffalo SLS	
Catt. Aleg-Erie-Wyo. BOCES SLS	
Chaut. Co. SLS	
Erie 1 BOCES SLS	
Erie-Catt 2 BOCES SLS	
Genessee-Wyo. BOCES SLS	
Orleans-Niagara BOCES SLS	
	1,045

APPENDIX C

TABLES OF ANALYSIS

TABLE C.1A-C.1C

TABLES OF SIGNIFICANCE OF TECHNOLOGICAL SUPPORT BY LEVEL OF INVOLVEMENT

TABLE C.1A

TELEPHONE IN THE LIBRARY MEDIA CENTER

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	51 (18.1)	25 (8.9)	10 (3.6)	86 (30.6)
Medium	32 (11.4)	16 (5.7)	12 (4.3)	60 (21.4)
High	52 (18.5)	43 (15.3)	40 (14.2)	135 (48.0)
TOTAL	135 (48.0)	84 (29.9)	62 (22.1)	281

chi-square = 13.433, df=4
p=0.009 (significant at p<.05), gamma coefficient = 0.302

TABLE C.1B

USE OF A MICROCOMPUTER FOR LIBRARY/MEDIA CENTER MANAGEMENT

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	58 (20.9)	28 (10.1)	13 (4.7)	99 (35.7)
Medium	35 (12.6)	16 (5.8)	19 (6.9)	70 (25.3)
High	39 (14.1)	40 (14.4)	29 (10.5)	108 (39.0)
TOTAL	132 (47.7)	84 (30.3)	61 (22.0)	277

chi-square = 14.142, df=4
p=0.007 (significant at p<.05), gamma coefficient = 0.271

TABLE C.1C

USE OF TELECOMMUNICATIONS

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	76 (28.9)	28 (10.6)	21 (8.0)	125 (47.5)
Medium	31 (11.8)	24 (9.1)	19 (7.2)	74 (28.1)
High	16 (6.1)	24 (9.1)	24 (9.1)	64 (24.3)
TOTAL	123 (46.8)	76 (28.9)	64 (24.3)	263

chi-square = 23.438, df=4
p=0.000 (significant at p<.05), gamma coefficient = 0.391

TABLE C.2A - C.2C

TABLES OF SIGNIFICANCE OF HUMAN SUPPORT

BY LEVEL OF INVOLVEMENT

TABLE C.2A

FUNDS FOR INTERLIBRARY LOAN IN BUDGET

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	75 (27.7)	40 (14.8)	40 *(14.8)	155 (57.2)
Medium	36 (13.3)	26 (9.6)	14 (5.2)	76 (28.0)
High	16 (5.9)	14 (5.2)	10 (3.7)	40 (14.8)
TOTAL	127 (46.9)	80 (29.6)	64 (23.7)	271

chi-square = 3.396, df = 4
p=0.494, (not significant at p<.05)
gamma coefficient = 0.021

TABLE C.2B

FUNDS FOR NETWORK MEMBERSHIP DUES

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	72 (27.8)	44 (17.0)	38 (14.7)	154 (59.5)
Medium	27 (10.4)	19 (7.3)	10 (3.8)	56 (21.6)
High	23 (8.9)	15 (5.8)	11 (4.2)	49 (18.9)
TOTAL	122 (47.1)	78 (30.1)	58 (22.4)	259

chi-square = 1.256, df=4
p=0.869, not significant at p<.05
gamma coefficient = -0.034

TABLE C.2C

FUNDS FOR NETWORK ACTIVITIES

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	74 (27.7)	26 (9.7)	26 (9.7)	126 (47.2)
Medium	34 (12.7)	35 (13.1)	20 (7.5)	89 (33.3)
High	19 (7.1)	19 (7.1)	14 (5.2)	52 (19.5)
TOTAL	127 (47.6)	80 (29.9)	60 (22.5)	267

chi-square = 13.933, df = 4
p=0.008 (significant at p<.05), gamma coefficient = 0.235

TABLE C.3A - C.3F

TABLES OF SIGNIFICANCE OF HUMAN SUPPORT

BY LEVEL OF INVOLVEMENT

TABLE C.3A

SCHEDULED MEETINGS WITH LIBRARIANS OF OTHER TYPES OF LIBRARIES

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	34 (12.1)	12 (4.3)	6 (2.1)	52 (18.4)
Medium	73 (25.9)	45 (15.96)	19 (6.7)	137 (48.6)
High	28 (9.9)	25 (8.9)	40 (14.2)	93 (33.0)
TOTAL	135 (47.9)	82 (29.1)	65 (23.0)	282

chi-square = 35.844, df = 4
p=0.000, significant at p<.05, gamma coefficient = 0.442

TABLE C.3B

INTERLIBRARY LOAN WRITTEN POLICIES

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	50 (18.7)	22 (8.2)	10 (3.8)	82 (30.7)
Medium	62 (23.2)	41 (15.4)	22 (8.2)	125 (46.8)
High	12 (4.5)	18 (6.7)	30 (11.2)	60 (22.5)
TOTAL	124 (46.4)	81 (30.3)	62 (23.22)	267

chi-square = 38.139, df=4
p=0.000, significant at p<.05, gamma coefficient = 0.452

TABLE C.3C

LOCAL FORMAL LIBRARIANS ORGANIZATION

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	63 (23.9)	31 (11.7)	28 (10.6)	122 (46.2)
Medium	43 (16.3)	37 (14.0)	17 (6.4)	97 (36.7)
High	15 (5.7)	13 (4.9)	17 (6.4)	45 (17.1)
TOTAL	121 (45.8)	81 (30.7)	62 (23.5)	264

chi-square = 10.788, df = 4
p=0.029 (significant at p<.05), gamma coefficient=0.171

TABLE C.3D

SCHOOL ACCESS TO EXTERNAL RESCURCES

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	43 (16.0)	19 (7.1)	12 (4.5)	74 (27.6)
Medium	51 (19.0)	35 (13.1)	16 (6.0)	102 (38.1)
High	33 (12.3)	24 (9.0)	35 (13.1)	92 (34.3)
TOTAL	127 (47.4)	78 (29.1)	63 (23.5)	268

chi-square = 18.652, df = 4
p=0.001 (significant at p<.05), gamma coefficient=0.297

TABLE C.3E

STAFF SUPPORT SINCE NETWORK MEMBERSHIP

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	78 (30.0)	32 (12.3)	36 (13.9)	146 (56.2)
Medium	30 (11.5)	33 (12.7)	16 (6.2)	79 (30.4)
High	15 (5.4)	12 (5.0)	8 (3.1)	35 (13.5)
TOTAL	122 (46.9)	78 (30.0)	60 (23.1)	260

chi-square = 10.876, df = 4
p=0.028 (significant at p<.05), gamma coefficient=0.125

TABLE C.3F

SCHOOL SYSTEM (DISTRICT) LEVEL SUPPORT

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	48 (19.0)	11 (4.4)	9 (3.6)	68 (26.9)
Medium	49 (19.4)	38 (15.0)	18 (7.1)	105 (41.5)
High	21 (8.3)	26 (10.3)	33 (13.0)	80 (31.6)
TOTAL	118 (46.6)	75 (29.6)	60 (23.7)	253

chi-square = 36.825, df = 4
p=0.000 (significant at p<.05), gamma coefficient=0.477

TABLE C.4A - C.4G

TABLES OF SIGNIFICANCE OF ACTIVITIES AND APPLICATIONS

TABLE C.4A

EXCHANGE OF SERIALS HOLDING LISTS

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	43 (16.1)	21 (7.9)	9 (3.4)	73 (27.3)
Medium	57 (21.4)	37 (13.9)	13 (4.9)	107 (40.1)
High	27 (10.1)	20 (7.5)	40 (15.0)	87 (32.6)
TOTAL	127 (47.6)	78 (29.2)	62 (23.2)	267

chi-square = 38.697, df = 4
p=0.008 (significant at p<.05), gamma coefficient=0.396

TABLE C.4B

FORMATION OF A UNION CATALOG OF SERIALS

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	53 (20.4)	21 (8.1)	9 (3.5)	83 (31.9)
Medium	46 (17.7)	30 (11.5)	14 (5.4)	90 (34.6)
High	23 (8.9)	25 (9.6	39 (15.0)	87 (33.5)
TOTAL	122 (46.9)	76 (29.2)	62 (23.9)	260

chi-square = 38.693, df = 4
p=0.000 (significant at p<.05), gamma coefficient=0.472

TABLE C.4C

EXCHANGE OF SPECIAL COLLECTIONS INFORMATION

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	62 (23.9)	26 (10.0)	20 (7.7)	108 (41.7)
Medium	46 (17.8)	36 (13.9)	27 (10.4)	109 (42.1)
High	13 (5.0)	14 (5.4)	15 (5.8)	42 (16.2)
TOTAL	121 (46.7)	76 (29.3)	62 (23.9)	259

chi-square = 10.896, df = 4
p=0.028 (significant at p<.05), gamma coefficient=0.277

TABLE C.4D

COOPERATIVE COLLECTION DEVELOPMENT

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	73 (28.1)	31 (11.9)	19 (7.3)	123 (47.3)
Medium	38 (14.6)	32 (12.3)	26 (10.0)	96 (36.9)
High	10 (3.8)	13 (5.0)	18 (6.9)	41 (15.8)
TOTAL	121 (46.5)	76 (29.2)	63 (24.2)	260

chi-square = 21.765, df = 4
p=0.000 (significant at p<.05), gamma coefficient=0.277

TABLE C.4E

COOPERATIVE TECHNICAL SERVICES

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	75 (28.8)	31 (11.9)	35 (13.5)	141 (54.2)
Medium	38 (14.6)	29 (11.2)	17 (6.5)	84 (32.3)
High	8 (3.1)	17 (6.5)	10 (3.9)	35 (13.5)
TOTAL	121 (46.5)	77 (29.6)	62 (23.9)	260

chi-square = 14.133, df = 4
p=0.007 (significant at p<.05), gamma coefficient=0.180

TABLE C.4F

MATERIALS DELIVERY SYSTEM

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	30 (11.2)	9 (3.4)	0 (0.0)	39 (14.5)
Medium	45 (16.7)	23 (8.6)	11 (4.1)	79 (29.4)
High	50 (18.6)	48 (17.8)	53 (19.7)	151 (56.1)
TOTAL	125 (46.5)	80 (29.7)	64 (23.8)	269

chi-square = 36.885, df = 4
p=0.000 (significant at p<.05), gamma coefficient=0.542

TABLE C.4G

TEACHING USE OF EXTERNAL RESOURCES

Significance	Level 1 n (%)	Level 2 n (%)	Level 3 n (%)	Total n (%)
Low	51 (20.4	20 (8.0)	21 (8.4)	92 (36.8)
Medium	49 (19.6)	32 (12.8)	24 (9.6)	105 (42.0)
High	16 (6.4)	21 (8.4)f	16 (6.4)	53 (21.2)
TOTAL	116 (46.4)	73 (29.2)	61 (24.4)	250

chi-square = 9.330, df = 4
p=0.193 (not significant at p<.05)
gamma coefficient=0.206

TABLE C.5

COMPARISON OF SIGNIFICANCE OF EVENTS:

SCHOOL NETWORK MEMBERS VS OCLC NETWORK MEMBERS

Event	n	chi-square	p		gamma coef.
phone	215	7.826	0.020	*	0.199
microcomputer	211	7.222	0.027	*	0.200
telecommunications	127	3.265	0.195		0.266
ILL funds	204	.783	0.676		0.109
dues	196	1.135	0.567		0.126
funds for activities	201	7.276	0.026	*	0.312
meetings	213	3.646	0.162		0.217
policies	205	11.918	0.003	*	0.378
orgzanizations	203	6.626	0.036	*	0.300
external resources	203	6.938	0.031	*	0.287
added staff	106	4.332	0.115		0.258
system support	191	6.247	0.044	*	0.294
serials list	202	21.298	0.000	*	0.505
serials catalog	198	13.665	0.001	*	0.400
special collections	197	3.970	0.137		0.238
coop. coll. develop.	196	10.582	0.005	*	0.378
coop. technical serv.	196	4.532	0.104		0.236
delivery system	205	10.974	0.004	*	0.298
reference skills	190	3.270	0.195		0.204

* significant at p<.05, df = 2

TABLE C.7

COMPARISON OF SIGNIFICANCE OF EVENTS:

POSITION OF RESPONDENT
BUILDING LEVEL VS SYSTEM LEVEL

Event	n	chi-square	p		gamma coef.
phone	230	5.145	0.076		-0.264
microcomputer	226	4.071	0.131		-0.166
telecommunications	216	0.453	0.797		-0.010
ILL funds	220	0.429	0.807		-0.024
dues	213	1.047	0.592		-0.034
funds for activities	220	3.398	0.183		-0.069
meetings	231	1.826	0.401		-0.168
policies	218	1.848	0.397		-0.130
orgzanizations	216	2.998	0.223		-0.177
external resources	220	7.101	0.029	*	-0.315
added staff	213	6.138	0.046	*	-0.226
system support	211	5.075	0.079		-0.084
serials list	219	6.102	0.047	*	-0.304
serials catalog	214	4.316	0.116		-0.230
special collections	212	0.872	0.647		-0.113
coop. coll. develop.	212	1.152	0.562		-0.145
coop. technical serv.	212	3.281	0.194		-0.261
delivery system	221	2.262	0.323		-0.071
reference skills	207	2.628	0.269		-0.207

* significant at p<.05, df = 2

TABLE C.7

COMPARISON OF SIGNIFICANCE OF EVENTS:

SIZE OF SCHOOL SYSTEM:
(Under 1,000, 1,000 to 2,499, Over 2,500)

Event	n	chi-square	gamma coef.	
phone	228	23.747	0.000 *	-0.195
microcomputer	225	4.828	0.305	-0.079
telecommunications	213	22.696	0.000 *	-0.351
ILL funds	220	6.836	0.145	0.128
dues	210	9.197	0.056	0.086
funds for activities	216	6.101	0.192	0.141
meetings	227	7.002	0.136	-0.152
policies	216	0.227	0.994	-0.037
orgzanizations	214	17.318	0.002 *	-0.194
external resources	216	5.737	0.220	-0.064
added staff	208	7.117	0.130	-0.076
system support	204	8.857	0.065	-0.190
serials list	213	9.923	0.042 *	-0.182
serials catalog	208	11.633	0.020 *	-0.229
special collections	208	5.235	0.264	-0.083
coop. coll. develop.	209	2.5962	0.628	-0.103
coop. technical serv.	211	1.090	0.896	0.024
delivery system	216	9.118	0.058	-0.233
reference skills	201	2.743	0.602	-0.064

* significant at p<.05, df = 4

TABLE C.8

COMPARISON OF SIGNIFICANCE OF EVENTS:

YEARS SINCE ADOPTION:
(Up to 5, From 6-10, Over 10)

Event	n	chi-square	p	gamma coef.
phone	248	4.288	0.368	-0.006
microcomputer	245	11.616	0.020 *	-0.129
telecommunications	236	0.929	0.920	0.010
ILL funds	239	1.490	0.828	-0.350
dues	230	2.595	0.628	-0.082
funds for activities	236	4.458	0.348	-0.176
meetings	250	2.029	0.730	0.117
policies	237	7.503	0.112	0.005
orgzanizations	234	3.448 +	0.178	-0.104
external resources	237	2.098	0.718	-0.001
added staff	230	4.355	0.360	-0.021
system support	224	8.187	0.085	0.017
serials list	238	7.389	0.117	0.186
serials catalog	231	3.241	0.518	0.150
special collections	231	2.917	0.572	0.112
coop. coll. develop.	232	2.6692	0.615	-0.082
coop. technical serv.	233	11.035	0.026 *	-0.196
delivery system	241	1.881	0.758	-0.102
reference skills	224	4.285	0.369	0.057

* significant at p<.05, df = 4, except + where df = 2

APPENDIX D

QUOTATIONS FROM RESPONDENTS

COMMENTS AND QUOTATIONS FROM RESPONDENTS

Many respondents added comments, suggestions, and concerns. The following quotations are arranged by (1) benefits, (2) barriers, and (3) general comments. The respondent's state is indicated in parenthesis.

Benefits

"The School Library System has been great for our school. [It] has helped to join our librarians of the area together. We now know each other quite well and are a great support system for each other." (NY)

"The School Library System" has dramatically changed the role of the school library media specialist and the services we provide. Teachers and administrators also see us as resources for their professional information needs... I just can't describe how much more professional I feel, thanks to my connection to my School Library System." (NY)

"The largest hurdle to overcome is a delivery system. I believe this regional library system functions well because of the van delivery system which operates in the region." (MN)

Our district libraries have been involved in networking since 1980... our high school has been searching for ILL since 1985 and our elementary librarians have served on

[network] committees. We love networking. (NJ)

One non-member responded, "We can, however, call our public library and they will order materials from the co-operative for us."

Out district libraries have been involved in networking since 1980. We love networking!" (NJ)

"I feel that the personnel in the job is #1 in moving towards successful networking!" (MI)

The main reason we are using the services of inter-loan library is that we are a small rural school with no other library in the community. By being affiliated with RICK, we can get materials needed for projects at a reduced cost, and quicker.

In upper lower Michigan you network or perish. Our administration is in love with technology. The librarians are knowledgeable and we have excellent REMC directors and very good relationship with the public library. (We meet them more than half way to make this work.)

It is difficult to assess our school's movement toward networking. We joined the ...cooperative, frankly, because it does not cost any money and here are many advantages for obtaining materials. Joining was accomplished through the efforts of 2 high school librarians working on their own to get the Board of Ed. to pass a resolution to the effect that

the district wanted to become a member. (NJ)

We are very small with a collection of about 8,000 books and 53 periodicals. We use our network to borrow materials not in our files with the understanding that we try to acquire for ourselves materials we use a lot. (MN)

The primary services we use are AV loans and interlibrary loans. .. The equipment repair service from ... is also very useful to us. Two years ago our library conducted a retroconversion to OCLC through ... so that we are now able to loan our materials through interlibrary loans. (CO)

Barriers

"Because our libraries are closed...I am not able to complete the questionnaire. 'Financial Straits'"; this was signed with a frowning face from a non-participating member.

Another non-participant wrote, "I don't know what cooperative we're a part of."

"I fear that school boards will see cooperatives as a means of cutting budgets for materials. In fact, in New Jersey one high school has almost no collection of its own!! My budget this year is 1/2 of the former amount. [My superintendent] smiled and said that "now we are part of the cooperative, we don't have to spend as much for books."

General Comments

"There are many opportunities open to us and we need them as we are rather isolated and very small. But it takes knowledge, money, and time! We are trying!"

I think networking is based upon 1- person in job; 2- available local networking opportunities (already setup ways to network) 3- support of administrators. (MI)

The School Library System has dramatically changed the role of the school library media specialist and the services we provide. Teachers and administrators also see us as resources for their professional information needs. On-line searching is not covered in your list & should be as it is a major benefit. I just can't describe how much more professional I feel, thanks to my connection to my School Library System. (NY)

My primary motive for joining the cooperative is to be able to offer computer searching to our students. The network made it affordable t $2,000 for a CD-ROM unit. We must change school libraries from the 3 x 5 card catalog of Melville Dewey's days to the computer services available in public and academic libraries that they will use as adults.

School board don't have lots of money for computerized library systems. I managed to talk them into $2,000 for the equipment to run as part of the network. However, I fee that School boards will see cooperatives as a means of cutting budgets for materials. In fact, in New Jersey, ... High School is a case in point. A 'networked' school wi'' almost no collection of it own!! My superintendent told me how he, too, feared this development when we entered the system, but at the time, assured me that we would "maintain our high standards." I felt reassured until I saw my next budget - 1/2 of the former amount. He smiled and said that, "now we are part of the cooperative, we don't have to spend as much for books." He has since gone to greener pastures, but the next one may well hold the same ideas. (NJ)

RESOURCES

RESOURCES

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