DOCUMENT RESUME

ED 225 552 IR 010 559

AUTHOR Woolls, Blanche; And Others
TITLE The Use of Technology in the Administration Function of School Library Media Programs.
INSTITUTION Pittsburgh Univ., Pa.
SPONS AGENCY Office of Libraries and Learning Technologies (ED), Washington, DC.
PUB DATE 1 Mar 82
NOTE 144p.; For related document, see IR 010 560.
PUB TYPE Information Analyses (070) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC06 Plus Postage.
DESCRIPTORS Annotated Bibliographies; Case Studies; Elementary Secondary Education; *Learning Resources Centers; *Library Administration; *Library Cooperation; Literature Reviews; *Public Libraries; School Libraries; *Technology Transfer; *Use Studies

ABSTRACT

The state-of-the-art review on the use of technology in the administration of school library media programs and in school library/public library cooperation which is presented is based on a literature review and interviews with media specialists from nine states. Additional information is incorporated from a survey of the status of technology in the Albuquerque Processing Center (New Mexico), The Shawnee Mission, Kansas Schools, and Leavenworth High School (Kansas), and from commercial vendors queried to determine use of their online systems by school districts. The introduction describes the study methodology, and provides a historical perspective through an analysis of pre-1973 literature. A 17-page annotated bibliography of more recent materials is divided into the major categories of basic information or descriptive information and applications of technology. Using administrative functions outlined for the study, general and specific trends in technology utilization are analyzed in the areas of technical services, circulation, security systems, information retrieval, budgeting and staffing, and other functions. A listing of 23 recommendations for future planning concludes the report. Appendices contain the case studies from Alabama, Colorado, Florida, Illinois, Indiana, Maryland, Minnesota, New York, and Wisconsin; a list of study participants; and an interlibrary information retrieval chart. (LMM)

The Use of Technology in the Administration Function of School Library Media Programs

by

Blanche Woolls, Professor, University of Pittsburgh

David Loertscher, Program Coordinator
Instructional Resource Education
University of Arkansas

Marvin Davis, Director, Heartland Area
Education Agency Media Center, Ankeny, Iowa

Ann Weeks, Doctoral Studies,
University of Pittsburgh

Submitted to
U.S. Department of Education
400 Maryland Ave., SW, ROB-3,
Rm. 3622
Washington, D.C. 20202
Attn: Frank A. Stevens

March 1, 1982

Prepared for the United States Department of Education, Office of Educational Research and Improvement, Office of Libraries and Learning Technologies. (The contents of this paper do not necessarily reflect the views or policies of the Department of Education.)

TABLE OF CONTENTS

ACRONYMS AMD INITIALISMS

Professionals in the library and information community, as do members of many other professions, use a great many shortened names or titles. Such use of abbreviations may confuse a reader who is not a regular member of the specific professional community. For this reason, a list of acronyms and initialisms used throughout this study are spelled out below. Full titles are also used at the first mention in the text:

AIMS -- Automated Instructional Materials Handling System

ALPS -- Automated Library Processing System

AVTE -- Adult Vocational and Technical Education

BATAB -- Baker and Taylor's Automated Buying System

BCR -- Bibliographic Center for Research

BOCES -- Board of Cooperative Educational Services

CAI -- Computer-Assisted Instruction

CESA -- Cooperative Educational Service Agencies

CLSI -- Computer Libraries Services, Inc.

ETN -- Educational Telephone Network

ERIC -- Educational Resources Information Clearinghouse

FAME -- Florida Association for Media in Education

FASTER -- Filing and Source Data Entry Technique for Easier Retrieval

FCC -- Federal Communication Commission

FLIN -- Florida Library Information Network

ILLINET -- Illinois Library and Information Network

IMS -- Instructional Materials Centers

INCOLSA -- Indiana Cooperative Library Services Authority

KWIC -- Key Words in Context Index

LSCA -- Library Services and Construction Act

MARC -- Machine Readable Cataloging

MICROCAT -- Maryland Department of Education's microfiche data base

NCLIS -- National Commission on Libraries and Information Science

NIE -- National Institute of Education

OALS -- Formerly OTIS, Oregon Total Information System

OCLC, Inc. -- Formerly Ohio College Library Center

RTI -- Research Technology Incorporated

SEEN -- Statewide Extension Educational Network

SOLINET.-- Southeastern Library Network

INTRODUCTION

This study was designed to meet the specificiations for the project and presents a state-of-the-art report on the use of technology in the administration of school library media programs as well as the use of technology in school library/public library cooperation. The literature has been analyzed and an annotated bibliography has been completed.

Nine individuals in schools, school district media centers, regional centers, and one university Learning Resource Center were called to determine the actual utilization of technology for management purposes in school library media centers. The individuals were chosen after nine states had been identified as having well-established programs utilizing technology for cooperative activities between schools and public libraries, were considered avant garde in the utilization of technology in school media centers, or represented a unique adaptation of technology in the administrative functions of school media centers. In addition to the above, geographic distribution was also considered.

Additional information was collected to confirm the present status of technology in the Albuquerque, New Mexico Processing Center, The Shawnee Mission, Kansas Schools, and Leavenworth (Kansas) High School because of known long-standing commitments to high technology. Commercial vendors were queried to determine the use of their on-line systems by school districts. Trends in the use of technology in the administration of school library media services have been identified and recommendations have been made for future planning.

In order to set the parameters for the paper, a definition of "administrative functions" will be

> the activities and duties within the school library media center which direct or control the provision and utilization of information, materials, equipment and staff.

These activities and duties include

technical services (shared cataloging, acquisition)

scheduling (films, equipment, maintenance of equipment)

circulation

interlibrary loan

information retrieval (data bases)

security systems

budgeting

staffing

other clerical functions.

A definition for "technology" does not seem to be as simple. In 1976, Richard DeGennaro wrote that

> In 1967, the literature of library automation was still very limited in scope and fell into two categories. At one extreme were the detailed technical papers written by systems librarians describing a specific application which was being implemented in a particular library. At the other extreme were general or visionary papers written by information scientists or librarians speculating on how computer technology was going to change libraries in the future.[1]

The implication here and in the viewpoints of many professionals might be that "library automation" and "technology" are synonymous with "computers." In 1982, this would be a very narrow definition of the term technology. For the purposes of this paper, technology will be defined as

> The entire array of equipment ordinarily activated by electricity and used to preserve, collect, extract, sort, reproduce, print, project or transmit information in any format.

The use of technology in the administration of the school library media center has parallelled the use of similar technologies in other types of libraries although utilization has probably not been as rapid or as in-depth. School library media centers, while larger in quantity when comparing the total numbers of centers, are smaller in facility size, numbers of potential users, and available budgets. In the immediate past, school library media specialists have had much less money to spend on experimental technologies. Grants for funding research in technology in library settings have more often gone to the larger institutions, public and academic libraries.

That is not to say that school library media centers have been without technologies. Telephones and typewriters have been standard equipment for many years. School library media centers were in the forefront of the initiation of audiovisual materials and services for users, and these agencies appear to be leading the way in the utilization of microcomputers.

ANALYSIS OF THE LITERATURE

Adaptations of advanced technologies before 1969 which were used to provide automation for school libraries were reported in an issue of Drexel Library Quarterly, April, 1969. In his article, Walter Stone considered that the equipment presently available "(and the many to come) do not perform effectively and will not in the future perform effectively, the most vital jobs school librarians do."[2] Yet, at the same conference, Mildred Breiland[3] reported the successful services of the centralized data processing center which was in place in the Albuquerque Public Schools. Not only did the center generate catalog cards for both books and audiovisual materials but

also ordered basic book collections for new schools, prepared buying lists, and ordered magazines, all vital jobs for school librarians.

The Leavenworth High School's Data Processing Library System for book orders, new book processing, and both shelf list and borrower's cards was reported in March, 1969[4]. The computer also reproduced cards for checked out books and generated addresses for students on post cards for first and second overdue notices. In the years which followed, many large and small school systems utilized computers to do some or all technical processing. More schools began to utilize the district's mainframe for circulation control and overdues.

In 1982, both systems described above are still in operation. The Albuquerque Public School's central processing center, currently under the direction of Catherine Higgins, continues to use a mainframe for processing materials. As of January 1, 1980 holdings were automated and the center went online with eight terminals rather than utilizing batch processing as had been done previously. Automated inventory is projected and an automated circulation system is planned for the high schools within the next three years. This new system should permit the implementation of interlibrary loan between schools.

At present the Albuquerque staff is also cataloging the district's 16mm collection and have recently added the audiotapes for the radio station to the data base. A total of 15,000 film titles is listed in an annotated catalog which is currently being placed on microfiche.

When a card catalog was destroyed, processing center staff used the computer to reproduce main entry cards of the entire collection on microfiche. Staff members have recently taken the fiche and the

fiche readers to this particular school where they found that training was not difficult and that students were very successful in utilizing the fiche for access to their collection.

The professional library collection has also been entered into the computer. An annotated list of the professional collection is also available on microfiche. Staff are investigating the possibility of sharing this with other interested school districts. They are also considering methods which would make the complete data base available to other schools in New Mexico for cataloging purposes or for the generation of fiche catalogs.

Dr. Dwain Scott reports that the online circulation system at Leavenworth High School is still in place and that no major changes have been made since its installation. Cumulative statistics generated by the system in the various Dewey categories are still used for ordering and teacher and student awareness projects. The school district is installing a new computer system in the near future and it is hoped that bibliographic control will become possible.

Shawnee Mission's original system used a small computer to do batch ordering, cataloging, and batch circulation. Later they converted to IBM's Filing and Source Data Entry Technique for Easier Retrieval (FASTER), a program adopted from the Kansas City Police Department.

Beverly White reports that the automated cataloging system is still in operation in 1982. The complete holdings of the district are not only on computer but also are available on microfiche for the entire district. Closing schools and redistributing collections is no problem since materials can be recataloged by computer and sent to

other locations within the district. The old card catalogs are then discarded.

One of the greatest benefits derived from having the complete holdings of the district available on the computer is the capability of generating bibliographies relating to any subject headings used through- out the system. These bibliographies can be generated to include a single school's holdings, neighboring schools' holdings, or the entire district-wide holdings. The collection of the entire district can be analyzed by subjects such as the number of science books which are 10 years or older.

After completing a search of the literature concerning the use of technology in school library media centers prior to 1973, a more extensive review was conducted of the articles since 1973 with particular emphasis on recent information (1977 to present). The literature does not reveal an overwhelming number of articles which would require sifting and sorting through to select the best. In the two sections which follow, the administrative functions chosen for the study are listed and the corresponding articles are indicated. Articles may be located in the annotated bibliography which contains citations to these articles, other general articles on technology and specific articles on the use of technology in school media centers.

In the bibliography, technical services were divided into two areas: acquisitions and cataloging/processing. A general discussion on acquisitions is written by Pearson while Burke provides procedures for automating acquisitions. Epstein describes the acquisitions procedures in the Madison schools. Bajema provides benchmark budget costs for various specific acquisitions functions. Acquisition and processing for one school district are handled by a commercial firm, Baker and Taylor's BATAB (Walston).

Articles on cataloging and processing with the use of the technology include discussions of centers where centralized processing is done by mainframe computer (Carmody) (Holmes); cataloging by microcomputer (Costa); and by OCLC, Inc. (Deal) (Denver School System). One article discusses cataloging of audiovisual on a mainframe (Rewerts).

One of the cataloging and processing activities has implications for circulation, interlibrary loan, and information retrieval. This is the production of computer catalogs of materials. The topic is discussed by Brown, Burke, Glidden, and Schwartz.

The information on circulation systems includes one general article with some buying guides (Pearson), a cost analysis (Bajema), utilization of two specific commercial systems, CLSI (Nylen) and Autobook (Vollbrecht) (Zolton), a specific type of system, bar code reading (Hoffman), and a system for a specific type of material, film circulation (Smith, M). The use of minicomputers (Hamner) and microcomputers (Lee) for circulation is described as well as systems which write overdues only (Donovan). Overdues may be written on a word processor (School has computer. . .).

One interlibrary loan system which was automated with computer transmission and teletypes between high schools, colleges and public libraries was described (Taggart). A step by step process to set up an interlibrary loan system was written by Kolb.

Information retrieval with online data bases is reported in two articles by Dowling. Data bases for schools are described by Franckowiak. A statewide data base listing of films in school districts on a computer was established in Michigan (Grimes). A commercially produced data base, Guidance Information System, which

produces education and career information is discussed by Lindberg. The ERIC system (Epstein) appears to be the most popular data base for school use. Williams points out the effectiveness of a microprocessor in online information systems.

The relative merits of three types of security systems is discussed by Shirley. Two school library media specialists in Canada give very specific information about the cost savings of their automated security systems (Burdenuk) (Mott).

A general article on budgeting, written by Curley appears to be the only one on this topic.

Interlibrary cooperation in the United States began almost as soon as libraries were organized. Advances in technology, first the telephone, then the teletype, and ultimately the computer, improved the means by which librarians exchanged information and resources. Informal cooperative arrangements evolved into formalized systems and systems became computer-based networks.

Although school library media specialists were rarely involved in the early development of computerized library networks, schools or school districts are now participating in single and multitype networks in at least twenty-six states. The contributions, benefits, and problems of school library media center participation in networks were extensively described in a 1975 National Commission on Libraries and Information Science (NCLIS) publication;[5] however, actual reports of the technologies used in school/public library cooperation have only recently begun to appear.

School and public library cooperation is described by Aaron and in the report of the Illinois Interlibrary Cooperation (Consultant) Program (School of Library Science). The New York pilot projects

include regional networks for intersystem cooperation (New Directions). Persons wishing to establish formal cooperative procedures might wish to consult the "Memorandum of Agreement" and "Guidelines for Systems working with School Libraries in the Illinois Library and Information Network" (Expanding Illinet). A state network, INCOLSA, and its services are described by both Alexander and Land.

The literature on technology in the administration of school library media centers has provided both an historical perspective and an update of examples of current usage. Additional uses were sought through the interviews with personnel in the nine states. These "case studies" are found in Appendix A.

FOOTNOTES

[1]Richard DeGennaro, "Library Automation: Changing Patterns and New Directions," Library Journal 101 (January 1, 1976): p. 175.

[2]Stone, Walter, "Improved School Library Service Through Automation," Drexel Library Quarterly 5 (April, 1969): p. 73.

[3]Mildred Breiland, "Centralized Data Processing for Libraries in the Albuquerque Public Schools," Drexel Library Quarterly 5 (April, 1969): p. 92.

[4]Betty Flora and John Willhardt. "High School Library Data Processing," Journal of Library Automation 2 (March, 1969): 10-19.

[5]Task Force on the Role of the School Library Media Program in the National Program, Role of the School Library Media Program in Networking, Washington, D.C.: National Commission on Libraries and Information Science, 1978.

BIBLIOGRAPHY OF THE USE OF TECHNOLOGY IN THE ADMINISTRATION FUNCTION OF SCHOOL LIBRARY MEDIA PROGRAMS

As a part of this study on technology in the administration of school libraries, a search of the literature was undertaken. The historical perspective was gleaned from a brief survey of the literature prior to 1973. Three publications would be of interest to those who wish to study the evolution of automation in school library systems. The first of these is a report of a 1963 Clinic on Library Applications of Data Processing, held on April 28-May 1, 1963. While school libraries were not highlighted, the applications reported in the publications below have useful historical perspectives for school library media specialists today:

Goldhor, Herbert, ed. Proceedings of the 1963 Clinic on Library Applications of Data Processing. Champaign, Ill.: University of Illinois Graduate School of Library Science.

In 1969, Drexel Institute of Technology's Graduate School of Library Science held a conference on Data Processing for School Libraries. Papers from this conference covered such varied topics as hardware and software techniques, improving school library service through automation, acquisitions programs, the card catalog, centralized processing, and automated reviewing programs. The proceedings of this conference may be found in:

Long, Marie, ed. "Data Processing for School Libraries." Drexel Library Quarterly 5 (April, 1969): 61-131.

Papers presented at the LARC Institute on Automation of Libraries in School Systems which was held in Pomona, California at the Kellogg Center of the California State Polytechnic University on September

27- 28, 1973, featured the Automated Instructions Materials Handling System (AIMS) project in the Los Angeles City Schools and Oregon's Oregon Total Information System (OTIS), later renamed OALS, systems.

The AIMS system was to provide inventory control, an on-line interactive booking system for 16mm films, a materials ordering program and a management program for the evaluation of materials file. It also included an accounting and budgeting program and a MARC system for evaluation, ordering and cataloging the materials. OTIS/OALS provided book or media catalog production, reports of media evaluations, online booking and scheduling for the instructional materials center, and a circulation and inventory system for textbooks. Further information is found in

Proceedings of the LARC Institute on Automation of Libraries in School Systems. California State Polytechnic University, Pomona, California, September 27-28, 1973.

The annotated bibliography which follows is divided into two major divisions: Basic information or descriptive information and applications of technology. No other articles or monographs are cited before 1973.

Basic Information

"Affordable Databases: Information Utilities and Bibliographic Retrieval." ACCESS: Microcomputers in Libraries 1 (October, 1981): 7-9, 20, 22, 27-28.

A catalog of five information utilities (The Source, CompuServe, DIALOG, System Development Corporation, and RLIN) their data, services, and fees.

Ashford, John. "Software Cost: Making or Buying It." Program 10 (January, 1976): 1-6.

"... checklist of factors to be considered when deciding on the use of a minicomputer for library housekeeping routines ... software development in relation to library characteristics. Costs of packages and colloborative systems."

Blaschke, Charles L. "Microcomputer Software Development for Schools: What, Who, How?" Educational Technology 19 (October, 1979): 26-28.

Results of a survey of 1,200 respondents to mailed questionnaires, telephone interviews, and meetings with users at six national education conferences. Problems with software development include "assurances that the hardware for which the software is developed will be widely used; and protection through copyrights and other incentives which increase the probability that the return on investment may be assured."

Clogston, Tom. "CBI for a High-Tech Industry." Instructional Innovator 25 (September, 1980): 22-24.

Minicomputer and Microprocessor training at the Boeing Aerospace Company in Seattle.

Coon, Judy and Brenize, Colleen. "Invasion of the Microcomputer or Now That I've Got It, What Do I Do With It?" Learning and Media 9 (Fall Quarter, 1981): 10-12.

The arrival of the microcomputer with the potential of one in every classroom presents a challenge to the library media specialist who "will play a decisive role in determining the types of programs that are established for instructional purposes within his/her district." Brief introduction to instructional strategies, memory, equipment available, and the need for computer literacy.

Davison, Wayne. "Minicomputers and Library Automation: The Stanford Experience." in 1974 Clinic on Library Applications of Data Processing, Proceedings, pp. 80-95. Urbana-Champaign, Ill.: University of Illinois, 1974.

The library automation system, BALLOTS, and the application of minicomputers for bibliographic searching with a proposal for a circulation system.

Douglas, Shirley and Neights, Gary. Microcomputers in Education--A Guide to Microcomputers. Harrisburg, PA.: Pennsylvania Department of Education, [n.d.]

Basic information on the selection and utilization of microcomputers.

Franckowiak, Bernard. "Networks, Data Bases, and Media Programs: An Overview." School Media Quarterly 6 (Fall, 1977): 15-20.

Articulates the benefits of school participation in networks and their potential contribution to a network.

Garraway, Hugh. "Computer Software: It's as Easy as 1, 2, 3." Instructional Innovator 25 (September, 1980): 20-21.

Briefly defines and describes computer software.

"Getting Started with Micro-computers." Instructional Innovator 25 (September, 1980): 10-11.

Introduction to this issue of the magazine which features articles on the microcomputer.

Grosch, Audry N. "Minicomputer--Characteristics, Economics and Selection for an Integrated Library Management System.". in 1974 Clinic (cited above) pp. 158-169.

Defines minicomputer and discusses specifications for purchase of hardware and software.

Horner, G. and Teskey, F. J. "Micro-Computer and the School Library." School Librarian 27 (December, 1979): 339-340.

"Our concern is with the micro-computer as a teaching tool in most subjects of the curriculum....As this will probably be its major use in schools, it would seem inevitable that the library is the sensible place to house such a machine...Programs could also be developed which would allow quick retrieval of information about different classes of books in the library.... Micro-computers could also be used to keep a complete file of the issue and return of books, the individual child's reading..."

Hyman, Mike. "The Role of Minicomputers in Libraries and Information Units." ASLIB Proceedings 30 (October-November, 1978): 373-382.

"...minicomputers, what they are and how much they cost....types of systems required in libraries [in Great Britain] and the availability of suitable software packages."

Ingoldsby, Tim C. "Confessions of a Microcomputer Illiterate or, You Too Can See the Light!" The Physics Teacher 16 (October, 1978): 434-435.

Concise description of the ways one person approached learning about micros with suggestions to be followed by other novices.

Kolb, Audrey. "Development and Potential of a Multitype Library Network." School Media Quarterly 6 (Fall, 1977): 21-27.

Describes the development of the Washington Library Network and points out the technology involved, what the network offers, and the participation of school media centers in the network's organizational structure.

Laird, Nicola R. "Career Education Data Bases and Systems." School Media Quarterly 6 (Fall, 1977): 28-32.

The description of a Career Information System (CIS) which contains vocational information which can be accessed by students.

Lennox, Mary F. Facilitating School/Public Cooperation: The Faculty-in-Residence Focus, 1981. Chicago: Chicago Public Library/ Chicago Library System, June, 1981.

A brief summary of national trends, concepts and practices in school/public library cooperation, an analysis of the need and trends of school libraries affiliating with networks, and an overview of the Chicago Library System and its relationship to the schools in a network for Chicago. Contains a "Library Cooperative Questionnaire Summary" of responses from the Public Library Branches and high school libraries. "Existing communications between CPL/CLS and school are not as effective as a mechanism of this magnitude requires."

Lopez, Antonio M. "Microcomputers: Tools of the Present and Future." School Media Quarterly 9 (Spring, 1981): 164-167.

"In the future, one might see quite a different library, so different that it might be called an information center. Electronic devices like computers, videodisks, slide projectors, and audio devices will play an important role in this futuristic environment."

Metz, T. John. "BRS/MIDLNET Helps Mr. Jones." Wisconsin Library Bulletin 73 (May-June, 1977): 101-102.

Brief description of one network and the Bibliographic Retrieval Services which it offers.

Michael, Frederick W. "Funding Sources for Microcomputers." Instructional Innovator 25 (September, 1980): 26-28.

Suggestions for "finding funds to purchase microcomputers and software instruction."

"Microcomputer Buying Guide." Media & Methods 18 (November, 1981): 18.

Manufacturers, by name and address, who produce microcomputers which can be programmed in BASIC, with four whose computers utilized interchangeable languages.

"Microprocessor-Based Library Circulation System." LASIE 9 (November-December, 1978): 36-41.

Microprocessors with Optical Character Recognition (OCR) wands for data entry to handle all functions provided by "manual systems."

Miller, Inabeth. "The Micros Are Coming." Media and Methods 16 . (April, 1980): 32-34, 72, 74.

The potential utilization of the microcomputer for education and also classroom record keeping.

Negus, A. E. "The Application of Minicomputers to Problems of Information Retrieval." In 1974 Clinic (cited above), pp. 96-103.

Advantages and disadvantages of microcomputer systems for information retrieval.

Nierengarten, John A. "Microcomputers in School Media Centers." Wisconsin Library Bulletin 76 (November-December, 1980): 273-274.

"There are many useful programs available including ones that determine the reading difficulty level of textbooks." Brief description of capability of microcomputers with tips for purchasing.

Nomeland, Ronald. "Some considerations in Selecting a Microcomputer for School." American Annals of the Deaf, 124 (September, 1979): 585-591.

Writing specifications after selecting capabilities and options.

Nyren, Karl, Ed. LJ/SLJ Hotline. 9 (May 26, 1980): 1-5.

Report of the ASIS midwinter conference which included brief summaries of a continuing education workshop concerning microcomputers in library automation.

Pratt, Allan D. "The Use of Microcomputers in Libraries." Journal of Library Automation 13 (March, 1980): 7-17.

"Small-scale computer systems are now of sufficiently low cost and high capacity that it is feasible to consider the use of one in many libraries." Their advantages and potential for improvement of library service at various levels are discussed. They seem well adapted for (1) text processing, (2) preparation of local bibliographies and resource guides, and (3) improvement of on-line data base searching.

"Quick! Tell Me How to Buy Library Security Systems." American School Board Journal 164 (August, 1977): 43.

Very brief explanation of the potential of an electronic security system and considerations to be given the installation of such a system in a school district.

"Resources are Macro for Micros." Instructional Innovator 25 (September, 1980): 29-31.

Names and addresses of manufactures of hardware, software as well as general magazines, newsletters, and software book publishers.

Smith, Malcolm. "Evaluation of Computers for Library Applications." LASIE 9 (1978): 2-14.

Evaluation of "a total system approach to systems with similar levels of sophistication, pointing out some pitfalls that may be encountered." No library applications are discussed as such. Author does conclude, "one should not forget to compare these costs with those of a manual system--too often we get carried away by computerization and end up paying more for poorer service. However, don't get the idea I am trying to frighten people away from computer systems. The main point I am trying to put across is to go into these projects with your eyes open."

Souviney, Randall. "There's a Microcomputer in Your Future." Teacher 97 (February, 1980): 53-58.

Introduces the microcomputer with emphasis on utilization for classroom management tasks.

Twaddle, Dan R. "School Media Services and Automation." School Media Quarterly 7 (Summer, 1979): 257-276.

"A survey and annotated bibliography of the professional literature related to the automation of school library services, K-12."

Wainwright, Jane. "Why Use a Minicomputer? Some Factors Affecting Their Selection." Program 10 (January, 1976): 7-13.

"...factors influencing the selection of computer facilities [in academic, public and special libraries in Great Britain]... Comparison is made between costs associated with inhouse mainframes and minis... [Explores] selection policy...staffing, software, hardware selection."

Basic Information with Educational Applications

"Microcomputers . . . The Future is Now." The Practitioner a Newsletter for the On-Line Administrator 11 (October, 1979)

Brief introduction to the educational applications of the microcomputer.

Milner, Stuart D. "How to Make the Right Decisions About Microcomputers." Instructional Innovator 25 (September, 1980): 12-19.

Introduction to representative systems with guidelines for selecting an educational system.

Nicklin, R. C. and Tashner, John. "Micros in the Library Media Center?" School Media Quarterly 9 (Spring, 1981): 168-181.

"An examination of the factors determining the placement of microcomputers in the library media center." Stresses educational utilization rather than library management applications."

Special Applications

Carren, Donald M. "Multiple Minis for Information Management." Datamation 21 (September, 1975): 54-56, 58.

Description of a system which provides fast responses to medical data such as patients' charts, ordering of supplies and services, scheduling operating rooms and other facilities, and maintaining records of charges accumulated.

Educational Applications

Arcanin, Jacob and Zawolkow, Geoffrey. "Microcomputers in the Service of Students and Teachers—Computer-Assisted Instruction at the California School for the Deaf: An Update." American Annals of the Deaf 125 (September, 1980): 807-813.

Authoring systems to adapt microcomputer programs for a variety of students.

Judd, Dorothy H. "Administrative Perspectives: Administrative Decision Tools: A Microcomputer Reality Available Now." Educational Computer Magazine 1 (July-August, 1981): 6-7.

Solving such educational administrative problems as school bus routes with a microcomputer.

Konopatzke, Pat. "Elmira High School Media Center Computer Program." Educational Computer Magazine 1 (July-August, 1981): 8-9.

A computer practicum program which permits high school students who have completed a programming class and are recommended by teachers and media specialist to write programs for teachers, develop learning programs, and tutor elementary students.

Krikelas, James. "Thinking About Automation? Consider These Factors in Making a Decision." Wisconsin Library Bulletin 73 (May-June, 1977): 98-100.

Some steps to follow in deciding whether or not to automate, or if to automate, what form of automation. Creation and maintenance of large files of bibliographic records in machine-readable form seem to be cost effective for large systems while circulation might be more cost effective for smaller units.

Lockard, James. "Computers Blossom at a Small School in Iowa." Instructional Innovator 25 (September, 1980): 25.

Computer skills teaching program at a private college in rural Iowa.

Lourey, Eugene D. "Systems Design for a Minicomputer-Based Library Data Management System." in 1974 Clinic (cited above) pp. 181-190.

Describes hardware and software and discusses cost considerations as well as site preparation and installation.

"Microcomputers in the Library/Media Center." TIES Total Information Educational Systems 8 (February-March, 1980): 9pp.

A very brief introduction to microcomputers.

Price, Camille. "Microcomputers in the Classroom." Mathematics Teacher 71 (May, 1978): 425-427.

"Microcomputers give students more insight into the working of a computer than do programmable calculators."

Romans, Anne F. and Ransom, Stanley A. "An Apple a Day: Microcomputers in the Public Library." American Libraries 11 (December, 1980): 691-693.

Why and how a public library purchased an Apple II microcomputer.

Thomas, Wes. "Up...Up...And Away...Satellite Communications Moving The World Into Your Classroom. Media & Methods 18 (September, 1981): 14, 16-17.

The utilization of satellite antennas--parabolic or spherical antennas, "dishes," to pick up educational satellite programs for classrooms.

Wilhelms, Fred T. "The ABC/NEA Schooldisc Program." Videodisc/Teletext 1 (Winter, 1981): 30-32.

"A project in which teacher-consultants developed ideas for video-teaching materials and television professionals implemented them." The development of 20 one-hour programs with teacher guides.

Library Applications

Aaron, Shirley L. School-Public Library Cooperation: A State-of-the-Art Review. Syracuse, N.Y.: ERIC Clearinghouse on Information Resources, Syracuse University, 1980.

Focuses "chiefly on cooperative activities between school and public libraries other than [emphasis this author's] those activities involving participation in multitype library networks" which means few references are made to the utilization of technology.

"Advancing ILLINET...Anticipations and Expectations for the Future." Illinois Libraries 57 (June, 1975): 405-407.

One school librarian's comments on the expectations from the networks which included communication concerning what the system can offer schools, reference services beyond what the school has

to offer, some help with selection (e.g., what album would have a particular piece of music on it?), perhaps a textbook selection center, and reinforcement in the use of reference tools by students.

Alexander, Janet. "School Libraries and the InCoLSA Network." Hoosier School Libraries 16 (December, 1976): 31-34.

Presents the network projects available for school media centers as well as a description of the MARC-based data base and the related cataloging services.

Bajema, Bruce D. "Marin County Free Library: Cost Effectiveness of a Dedicated Microcomputer for Acquisition and Circulation." in American Society for Information Science. Conference, 1975, Portland Ore. Information Roundup, pp. 57-61. ASIS, 1975.

Very concise budget costs for specific acquisition and circulation functions.

Brown, Thomas M. "School Libraries and Automation Systems--Some Thoughts." Illinois Libraries 60 (April, 1978): 420-422.

"The lack of sophisticated library automation should not be interpreted as a lack of need for nor a lack of interest in such a system." In 1974 a survey (which had only 19% return) showed that 252 of 1,030 school districts had electronic data processing equipment, but only ten districts reported any use of this equipment for library operations. One district planned to close the card catalog and generate a book catalog, one input catalog data, and several schools had punched card circulation systems.

Burdenuk, Eugene. "Secondary School Cuts Library Pilfering." Canadian Library Journal 31 (September-October, 1974): 386-388, 390-391.

Description of Checkpoint Mark I Security System illustrated with photographs. "The Timmons High and Vocational School experience shows the initial outlay can be recovered in one year. . . . One important question left unanswered is what effect will the security installation have on student attitude toward the library."

Burke, Michael A. "Automated Assistant for Media Professionals." Wisconsin Library Bulletin 73 (May-June, 1977): 120-121.

Describes procedures to be followed for the use of the computer to automate acquisitions of instructional resources, to produce catalogs, and to maintain the audiovisual equipment inventory in the Milwaukee Public Schools.

Byrne, Richard B. "As Through a Glass Darkly: Planning for the Unknowable Media Future." School Media Quarterly 10 (Fall, 1981): 22-28.

The potential of developing communication and information technologies for library media centers. "Librarians are strategically located at a unique point in the information gathering and distribution process. The librarian could be an important source of information for the creators of new information systems."

Carmody, Jean. "Computer Processing for Books: Oak Creek Public School District." Wisconsin Library Bulletin 73 (May-June, 1977): 122.

Centralized processing with a computer set up with some assistance from the Madison Public Schools.

Costa, Betty. "Letter to the Editor: Catalogs Via Microcomputers." School Library Journal 27 (March, 1981): 71.

Computerized card catalog with capability to transfer cataloging for new acquisitions from OCLC to the school's microcomputer.

Costa, Betty. "Microcomputer in Colorado--It's Elementary!" Wilson Library Bulletin 55 (May, 1981): 676-678, 717

Use of the microcomputer to replace the card catalog.

Costa, Betty and Costa, Marie. "Microcomputers in Libraries." Technicalities 1 (October 1981): 16.

Brief description of microcomputer card catalog project in an elementary school.

Curley, Walter. "The Minicomputer and the Computer Gap for Libraries." in 1974 Clinic (cited above) pp. 28-31.

Brief overview of some potential uses of a minicomputer in library operations from the standpoint of a commercial vendor. Stresses "business" applications.

Deal, Paula N. "Automation in School Media Programs: A State-of-the-Art Report with Particular Reference to the Ohio College Library Center Cataloging Services." MLS Thesis. Kent State University, 1976.

OCLC used by Lakewood, North Olmsted, and Shaker Heights City Schools.

DeGennaro, Richard. "Library Automation: Changing Patterns and New Directions." Library Journal 101 (January 1, 1976): 175-183.

An update of an article written in 1967 with comments on the progress of automation in the intervening years. "Many of the most important and controversial issus of the sixties have long since been resolved or have simply become irrelevant." The author predicts, as the next phase, an expansion of the "major success of the 1970's, the cooperative network." This phase will

be a combination of the network with the single library's inexpensive minicomputer system into "the development of cost effective in-house library, minicomputer processing and catalog access systems capable of interfacing synergistically with an effective national library network for sharing bibliographical data and library resources."

"Denver School System Automates Cataloging." School Library Journal 25 (March, 1979): 78.

Announcement of the contracting of School District No. 12 with the Bibliographic Center for Research (BCR) for a computerized library cataloging system to "allow the district's media center to increase the volume of processed materials by 59 percent without having to hire additional help or provide special housing" and to "enable media personnel to work directly with students and teachers by providing additional time."

Donovan, Ann. "The Computerized Overdue: A Vade Mecum." Wilson Library Bulletin 53 (February, 1979): 458-9.

Detailed explanation of a computerized system at Tarpon Springs, Florida, which generate overdues. Article includes such details as establishing the computer fields. A program found at the Science Center and help from the head of the math department contributed to the success of the program.

Dowling, Karen and Kirsch, Judy. "On-Line Information Retrieval in a Local Education Agency." School Media Quarterly 6 (Fall, 1977): 33-51.

Teachers, students, and county residents access on-line data bases through the Educational Materials Laboratory (EML) in the Montgomery County (Maryland) Public Schools.

Dowling, Karen. "The School Media Center Goes Online." Catholic Library World 53 (October, 1981): 120-121.

An online bibliographic retrieval system with access by secondary school students.

Driver, Russell and Driver, Mary Anne. "Automation in School Library Media Centers." School Library Journal 28 (January, 1982): 21-25.

"This article is a survey of the historical development of automated technical processing in schools."

Epstein, Hank and Epstein, Susan Baerg. The Effective Use of Automation in Wisconsin Libraries 1981-1985. Costa Mesa, CA.: Information Transform Industries, October, 1980.

"This report describes the current and future use of automation technology in Wisconsin libraries." Brief mention is made of the acquisitions systems in Madison Public Schools Media Center, the purchase of microcomputers by Cooperative Education Services

Agencies (CESAs) and some schools, and the Wisconsin Dissemination Project (WDP) which provides access to ERIC through the WDP office and the CESAs.

"Expanding ILLINET...Real Movement Toward a Multitype Library Network." Illinois Libraries 57 (June, 1975): 378-380.

Contains "Memorandum of Agreement" and "Guidelines for Systems Working with School Libraries in the Illinois Library and Information Network." Both documents serve as models for consideration for other states establishing networks." Ed. Note: Agreements for other states such as Indiana (INCOLSA) and New York were not available in the readily available published literature, but would also be of interest.

Franckowiak, Bernard. "Networks, Data Bases, and Media Programs: An Overview." School Media Quarterly 6 (Fall, 1977): 15-20.

A discussion of the available data bases which should be of interest to students, teachers, and media specialists.

Glidden, Iris. "Automation for Media Centers? West Bend Schools Have a Quartet of Print-out Catalogs." Wisconsin Library Bulletin 73 (May-June, 1977): 115-117.

Describes the steps followed in setting up the system which furnished book catalogs of audiovisual materials for a school system.

Grimes, George, and Hayhurst, Robert. "Regional Educational Media Services in Michigan: The REMC Automated Catalog Project," Michigan Librarian 41 (Winter, 1975): 9-11.

Describes a statewide data base on computer tape of films in the district collections. A manual was provided of the general rules for data, the subject headings to be used, codes for producers and distributors, and so forth.

Hamner, Walter G. "The Minicomputer and Its Use in Library Operations at the University of Maryland." in 1974 Clinic (cited above) pp. 32-42.

Minicomputers for circulation control in a decentralized library. Many details concerning actual operation.

Hicks, Warren B. and Tillin, Alma M. "Libraries and Technology-- Some Future Concerns." School Library Journal 23 (April, 1977): 27-32.

An overview of the potential utilization of six technologies in "multi-media" libraries: networks, computers, cable television, videocassettes and videodiscs, reprography, and programmed learning.

Hines, Theodore C., et. al. "Micros: Applications Today:" ACCESS: Microcomputers in Libraries 1 (October, 1981): 2, 21-22.

Lists equipment needed and library programs available from the author of the article to do catalog and typing, union lists, union catalogs, word processing, bibliographic listings, newspaper indexing, general indexing, rapid reference file ("computer searchable file of past reference questions and sources for answers--where the answers are brief--of the answers themselves"), subject and name authority files, vertical file heading lists, film bookings, inventories, patrons lists and others.

Hoffman, Charles. "The Computer in the High School Library." Catholic Library World 50 (July-August, 1978): 10-11.

Brief discussion of computer technology today with emphasis on on-line circulation systems. Highlights an optical bar-code reading technology system at the Charles County Community College in LaPlata, Maryland and lists potential benefits of the system.

Holmes, Rose. "Madison's Processing Endures." Wisconsin Library Bulletin 74 (November-December, 1978): 260, 265-266.

Discussion of present automated system in relation to alternatives including OCLC.

Humphrey, Darrell. "Computers in the Media Center of Tomorrow." Audiovisual Instrucion 22 (November, 1977): 24-26.

A "blue-sky ride . . . through MC Tomorrow Land" where computers and optical scanners and bar-codes circulate books and halt patrons with overdue materials. Many persons sit at interactive computer terminals to access full-text data bases; and all technical processes are aided by the computer.

Kolb, Audrey, and Morse, Jo. "Initiating School Participation in Networking." School Media Quarterly 6 (Fall, 1977): 52-59.

"A step-by-step approach to school media program involvement in shared resources and services."

Krubsack, Rosanne Yero. "Another School View of OCLC: CESA 14 and Southwest Wisconsin Search for Automation." Wisconsin Library Bulletin 74 (November-December, 1978): 264-265.

Pros and cons for joining OCLC with no decision reported at the time the article was prepared.

Land, Phyllis. "Schools--the On-Line Media Connection," pp. 176-181 of Galvin, Thomas J., Kimmel, Margaret Mary, and White, Brenda H. Excellence in School Media Programs. Chicago: American Library Association, 1980.

Description of a funded demonstration project to determine if the "cost of providing bibliographic control of audiovisual media can be significantly reduced through cooperative sharing of human, machine, and network data base resources. . . . Through the shared audiovisual cataloging in the demonstration, the present [OCLC] data base should be expanded by more than ten thousand new items."

Lee, Leona. "A Microcomputer Handles Overdues." School Library Journal 27 (April, 1981): 42.

Describes a system which produces a list of students by homeroom or with school numbers, addresses and home phone numbers. Shows or prints a student's account, a list of books in circulation by student number or by homeroom, prints overdue notices, Dewey classified numbers of books circulated, or letters to parents regarding overdue materials. Also locates a book that is in circulation.

Lindberg, Betty. "The Computer in a Media Center." Media Spectrum 3 (Fourth Quarter, 1976): 22.

Explanation of the use of Guidance Information System (GIS) to retrieve information on two- and four-year colleges, job descriptions, scholarships, and vocational and technical schools. Plans were underway to place the library's inventory on computer.

Loofboro, Debby. "Inquiry System for NEWIL Member Libraries." Wisconsin Library Bulletin 73 (May-June, 1977): 118.

A computer timesharing communications system which links computer terminals in schools to the Northeast Educational Processing Laboratory (NEPL). While terminals are used primarily for instructional purposes, librarians may send messages to specific schools, a general message to all member schools, list out specific messages or delete messages previously input into the system.

Lundeen, Gerald. "The Role of Microcomputers in Libraries." Wilson Library Bulletin 55 (November, 1980): 178-185.

"Recent advances in large scale integration of electronic components and attendant advances in mass storage technology are opening the possibility of automation for many small libraries that up to now could not afford to automate . . . The microprocessor, together with advances in communications technology, is making possible interactive 'videotext' systems which allow the public to access and communicate with libraries from home in new ways. This article examines the actual and potential applications of microcomputer systems in libraries, both in technical services/library automation and in public services as a new form of media.

Mott, Sharon. "An Edmonton High School Reduces Book Losses." Canadian Library Journal 35 (February, 1978): 45-49.

Describes a pilot study in the Edmonton Public School System "to report on the relative advantages and disadvantages of the library security system, to document some of the difficulties that might be encountered in introducing it into a high school and to recommend ways of minimizing these difficulties." A thorough report and analysis with detailed operating costs and annual financial benefits of the security system.

"New Directions: A Report of the Commissioner of Education Gordon M. Ambach to the New York State Legislature on Library Pilot Projects Organized Under Chapter 787, Laws of 1978 New York State Covering Period July 1, 1979-June 30, 1980." Albany, N.Y.: The University of the State of New York, The State Education Department, [1980?]

Report of the progress of "two pilot regional networks for intersystem cooperation, each to include public library systems, reference and research library resources systems, and one or more pilot school library systems."

Nyren, Karl, ed. LJ/SLJ Hotline 10 (October 5, 1981): 5.

The Atlantic County Public Library and the Absegami/Oakcrest High School Library plan to share a CLSI automated circulation system making holdings in both available to all. In its initial stages a consulting firm is handling the collection development in the high school as a part of the project.

Pearson, Karl M. "Minicomputers in the Library." Annual Review of Information Science and Technology 10 (1975): 139-163.

Library applications which are described in detail include circulation systems, acquisition and technical service operations. Also includes buying information for both hardware and software.

Rewerts, Ilene. "Print-out for Progress: Eau Claire Computerizes AV Holdings." Wisconsin Library Bulletin 73 (May-June, 1977): 119.

Brief description of the placing of bibliographic information concerning the audiovisual materials in elementary schools onto the district's computer thereby cataloging all nonprint in each of the 20 schools and providing a print-out listing of the audiovisual collection by subject and title.

"School Computer Aids Library and Students." School Library Journal 26 (August, 1980): 12.

Use of a Wang 2200 MPV computer system to find library books, identify overdues, locate those in classroom use, and tell the student's class. "The school had a three-year backlog of uncataloged books before the new system was installed."

School of Library Science, Texas Woman's University. Illinois Inter-Library Cooperation (Consultant) Program: An Evaluation 1975-1980. Denton, Texas: Texas Woman's University, 1981.

The final report of a study to examine the role of the interlibrary cooperation consultant. Recommendations are made for the expansion and improvement of multitype cooperation in Illinois.

Schwarz, Philip. "Producing a Computerized Catalog of Media Programs." Audiovisual Instruction 21 (May, 1976): 49-51.

Development of a computerized catalog in alphabetical order with a keyword-out-of-context (KWOC) index and a subject index. Provides cost and time estimates.

Scott, Marilynn S. "Automedia--Automated Techniques in the Management of Resources." Audiovisual Instruction 19 (June-July, 1974): 63.

An automated film circulation system.

"Security Systems in Use: Wisconsin Libraries/Media Centers Show Good Results." Wisconsin Library Bulletin 76 (May-June, 1980): 133-134, 144.

Summary of responses to a questionnaire concerning the effect of security systems. Reports are listed by library name under the name of the electronic system and under the heading "nonelectronic security measures."

Shaw, Violet. "Computer Cure." School Library Journal 21 (January, 1975): 29.

Use of students to write programs for overdues and bibliographies.

Shirley, Don. "Library Material Security Systems: A School District's Experience." School Library Journal 23 (April, 1977): 38-41.

Case study of the test of three different security systems: by-pass (automatic/manual), full-circulating (automatic), and person-at the door (manual). Reports the evaluation procedures established to determine effectiveness. Areas "tested" were reduction of losses, comparison of usage, cost-effectiveness, efficiency of systems, teacher and student attitude, and librarian's data.

Simmons, Peter. "Library Automation at the University of British Columbia: A 10-Year Progress Report." In American Society for Information Science. Conference, 1975 (cited above) pp. 87-95.

"Recent refinements in automated systems of the Library.... include the conversion of batch systems to on-line operation; the

use of mini-computers, resulting in more direct control of the Library over computer hardware; the substitution of microforms for paper printouts; and future participation in a centralized, province-wide, on-line bibliographic network."

Steepleton, Judith. "A School System Likes OCLC: Portage, Michigan Schools Went On Line in 1977." Wisconsin Library Bulletin 74 (November-December, 1978): 260, 263.

"We do feel that the advantages outweigh the disadvantages, and the information on the data base is well worth the effort we have put forth to secure it."

Sugranes, Maria. "Microcomputer Applications at Ocean View High School Media Center." California Media and Library Educators Association Journal 3 (Spring, 1980): 9-11.

Among a variety of educational uses, the media specialist has created "a bibliographic data base by using an Apple II free user program called File Cabinet. By using at least one disk for each Dewey category . . . a student could obtain the 000's disk and by typing in "Computers" he could obtain a print-out of all our holdings." They currently have been able to input the 000s, but no other Dewey category and are using this to give students an experience with a research tool of the future. The File Cabinet program is also used for the entire audiovisual equipment inventory to determine how much equipment is owned and in which department it is located. The variable message program is hooked up to the four-channel closed circuit television system and daily bulletins are beamed into some classrooms which have television sets, although not all do.

Taggart, Dorothy T. "Innovative Programs in Kansas Media Centers." Audiovisual Instruction 22 (November, 1977): 22-24.

A one-year pilot project tested the effectiveness of interlibrary cooperation through computer transmission and hookups, teletype connections with five teleprinters to teleprinter installations, or telephones between three high schools, seven college campuses, community colleges, and sixty-five public libraries. Since interlibrary loan requests were a net $9.95 per request or $18.94 per item supplied, the pilot was not continued. A second project, The Union Catalog Pilot Project," networked 10,000 fully cataloged audiovisual materials from all schools, public libraries, and a community college through the union catalog and through better communication among participants.

Taylor, Audrey and McCordick, Irene. "PRECIS: Indexing to Revolutionize Subject Access to Information in School Resource Centres." Canadian Library Journal 33 (December, 1976): 523, 525-528.

Report of the transfer of a manually-produced subject index in a Canadian high school to a machine-produced index, "automated to serve as a working model for the future development of a school

libraries network." PRECIS, "a method of indexing developed for the machine production of a printed subject index for the British National Bibliography" was chosen over Sears Subject Headings or the Library of Congress Subject Headings to provide an "open-ended vocabulary which allows terms encountered in the library materials to be freely admitted to the index [which] meets the curriculum needs of students."

Troutner, Joanne. "Videodisc at Memorial: A Case Study." Videodisc/Teletext 1 (Winter, 1981): 33-37.

"The utilization of videodisc [in the media center for use] in the education programs of a mid-western junior high school and the reactions of both students and faculty to the new technology are discussed." States advantages and disadvantages of this new technology.

Vollbrecht, John. "Will Future Media Centers Be Built Around Computers?" Audiovisual Instruction 19 (May, 1974): 42-44.

Use of a commercial program, Autobook, to book, route and bill media orders by computer.

Walston, Robert A. "A Materials Processing Center for the Austin Schools." Texas Library Journal 51 (Spring, 1975): 23-25.

School library media specialists select from a microfiche listing of 65,000 titles and use Baker and Taylor's Automated Buying System, BATAB, for acquisition.

"Why Videotex?" Media & Methods 18 (October, 1981): 6-7, 23.

An interview with Dr. Frank L. Greenagel explains why one encyclopedia is now completely machine readable. One reason given for this decision was that "We were certain that print would not only not be the exclusive means--but in all probability, in my lifetime, it will not even be the dominant means of distribution of the Academic American Encyclopedia. This encyclopedia is presently being added to the New York Times Information Service databank.

Williams, P. W. "The Potential of the Microprocessor in Library and Information Work." ASLIB Proceedings 31 (April, 1979): 202-209.

"The Use of a Microcomputer for Assisting Effective Use of Public On-line Information Systems" is described. Possible applications in a library environment are surveyed and recommendations are given on those tasks which are most suitable for the use of microcomputers.

Zolton, Ron. "We Also Book Skeletons." Media Spectrum 5 (1978): 13-14.

A computerized booking system in the Saginaw, Michigan Intermediate School District's Regional Media Center using the commercial program, Autobook.

ANALYSIS OF THE TRENDS IN THE USE OF TECHNOLOGY: FINDINGS OF THE STUDY

Trends in the use of technology in both the administration of school library media centers and in the use of technology in school library/public library cooperation are reported using as a guideline, the administrative functions which have been outlined for this study. The general trends are discussed before the more specific.

GENERAL TRENDS:

A lack of information exists in print concerning the successes and failures of projects using technology in the administration of school media centers. Experimentation in developing new management methods is going on in various locations around the country. Many persons using technology today developed their systems in isolation with little awareness that others were trying to accomplish the same tasks. Their experiences would be helpful to school administrators and library media specialists who wish to initiate, revise, or expand administrative functions of their media center management.

Standardization of microcomputers will make it easier for districts where a a central staff provides programming support, repair of equipment, and software development and acquisition. Regional centers that wish to circulate microcomputer software prefer the schools to have standardized equipment or will be forced to adapt existing software or purchase "overlapping" programs to meet the diversity of equipment. (Regional and district centers are incorporating the repair of microcomputers into their services and treating them as "just another piece of instructional equipment.").

Little software exists for use with microcomputers for media center management. Students and self-taught library media

specialists are often the programmers for locally developed computer software.

Some media specialists have found that the utilization of technology has resulted in actual budget savings which can be documented. Time savings provide opportunities for media specialists to assume more curriculum involvement; however, helping both media specialist and teacher to recognize the full potential will require inservice training.

Computer literacy in schools varies. Many students, teachers, administrators, and media specialists are quite sophisticated and others have never sat down in front of a computer terminal. While not all school library media specialists are eager to try a new technology, their resistance should be overcome. Personal resistance coupled with administrative reluctance may effectively keep new technologies from the management of media centers.

Using new technologies is an exciting prospect to many library media specialists. These interested media professionals are learning computer programming by teaching themselves or by taking courses. Others have been made aware of uses of technology through their membership and attendance in professional associations.

Many technologies of possible use to school library media specialists are not available to them because of their lack of awareness of the potential and because of a lack of encouragement from administrators to test these technologies. This is evident when the only reason a microcomputer is placed in the media center is that this is the only location in a building where the computer can be shared by teachers. It is viewed only as a classroom aid and not as having any media center management use. Most technologies require an

initial investment which is quite high and most school library media specialists have difficulty justifying these expenditures. If the obstacles are to be overcome, administrators in school districts must be convinced of the benefits to be derived.

TECHNICAL SERVICES:

Schools continue to use both mainframe and shared cataloging for technical services functions, but joining a network and using a bibliographic data base for shared cataloging appears to remain in the embryo stage. While some schools are members of networks and have access to OCLC, this form of new technology does not have widespread use. The apparent high cost of using this data base is a serious detriment to any but the largest school systems unless state support is provided or administrators and media specialists recognize the overall value of such a system. Those using OCLC have found that the system is now providing 40-50 percent of audiovisual cataloging requests. The use of an OCLC terminal to create a union list for potential networking of materials may be a method to "test" the potential of shared cataloging.

Use of automation in cataloging and processing appears to be cost effective; however, actual cost comparisons of the various methods of acquisitions and processing have not been made recently. Several locally developed automated cataloging and processing systems have been quite successful and provide a number of services not available from on-line systems.

Districts not tied into OCLC often subscribe to commercial sources of MARC information. The use of these standard records such as OCLC and MARCfiche should make any transfer of records and the generation of union lists easier than if each district did original cataloging.

Those districts which have access to a mainframe computer and have written their own cataloging and acquisition systems locally appear to be pleased with the products of their programs. Media specialists and media supervisors are expanding these basic cataloging systems by generating book or microfiche catalogs of the holdings of the central media center, particularly the professional library collection, and special collections in schools.

Several districts have developed some very useful spin-offs of a computer cataloging system. These new applications include

a. generation of buying or acquisitions lists

b. recataloging materials when schools close

c. evaluation of collection strengths and weaknesses

d. generation of bibliographies

e. facilitation of interlibrary loan both intra and inter district

f. key word indexes to collections.

Without the purchase of peripheral equipment such as hard disk storage or CPM systems, microcomputers do not yet have the storage capacity to handle technical services or online card catalogs needed by most school library media centers. Some school districts are beginning to purchase microcomputer systems with large storage disks, and this may be the wave of the future.

The use of a word processor to produce catalog cards is also available to some schools. Although this method speeds up the production of catalog cards, it does not produce an automated data base of the complete holdings that can be queried.

Automated typewriters as well as word processors are in use and are contributing to card catalog production and facilitating original

cataloging. They appear to be an excellent resource for technical services.

Five school districts are presently subscribing to Baker and Taylor's BATAB acquisition system, and another five school districts are presently subscribing to the BroDart system. Two school systems, Montgomery County (MD) and Jefferson County (KY) subscribe to Mini-Marc. Reliance primarily on the automated systems of jobbers to provide cataloging will continue until school district computers can interconnect to jobbers or other data bases for less expensive cataloging.

CONCLUSIONS: Most districts are using preprocessing from jobbers (which is automated, but not within the school district). Some districts are using OCLC and are very happy with this system while others have created "home-made" systems which are tailored to their own needs. The use of micros and word processors to automate certain technical processing appears to be a definite trend. The adaptation of commercial microcomputer software such as the DB Master or OSI may be useful for partial assistance for technical services.

Computer generated union lists and union catalogs appear to be a trend. Such lists in the form of book catalogs or microfiche will provide less expensive access for sharing and will make interlibrary loan a possibility among systems which cannot afford to join a computerized network.

Cataloging of selected segments of a collection rather than the total collection appears to be successful on a microcomputer. Several commercially available data handling programs such as DB Master, Visifile, and OSI seem to have the potential of handling these segments such as inventory control, cataloging and labels for a

paperback collection, and the generation of an "expensive-media" catalog.

Microcomputers are being used to establish the readibility level of materials to be used in the media center and the school. Microcomputers are being used to generate "speciality" computerized catalogs for 16mm films and other audiovisual media catalogs. As long as large volume storage for microcomputers continues to be expensive, proliferation of such speciality lists rather than total collections may continue. Using the microcomputer to list reserve collections, control of serials, and subject collection segments (e.g., Civil War or building trades) to meet local needs may help to control and share resources before indexing entire collections. Library media specialists are experimenting in these areas.

SCHEDULING:

Many districts have found computers to be cost effective in scheduling media, equipment or segments of a collection. The use of a mainframe or a microcomputer to schedule films from a district, regional, or state film library is common. Local programmers have developed most software for microcomputer systems for scheduling. While major film collections are on mainframes, one school district is pilot testing the Corvus disk on an Apple with software produced by a commercial firm, Research Technology, Incorporated (RTI).

CONCLUSIONS: A number of districts use mainframe computers and their own software to book films. Experimentation in booking with microcomputers is in its infancy, but it is likely to develop very rapidly. A "dedicated" computer available at all times is usually preferable to many of the time-sharing or batch systems on larger machines with other district responsibilities such as payroll. Also,

statistics generated as a result are often helpful in reporting use of materials and equipment to administrators.

CIRCULATION:

Some of the larger academic and public libraries have automated circulation systems, but very few schools have done so. While methods of maintaining circulation statistics are developing rapidly as microcomputers and word processors are acquired, most applications are limited to overdues. The storage capacity of the microcomputer and the word processor is not large enough to carry the number of records which would be necessary to handle a complete circulation system without adding expensive peripheral storage. Usually, first notices, followup notices, and even letters or postcards to be sent home are generated by microcomputer systems. Microcomputers can save 90 percent of the clerical time in the generation of overdues. When schools are faced with the loss of clerical help, such a savings in time may be critical. Many media specialists are computerizing overdues with both locally developed and adapted commercial software for their microcomputers.

CONCLUSIONS: Comprehensive circulation systems are very expensive and very few schools are able to afford these commercial systems. The use of a microcomputer to handle parts of the circulation process appears to be cost effective when implemented. Microcomputers are capable of handling the numbers of overdues generated by most school media centers.

SECURITY SYSTEMS:

Automated security systems are being used in some high schools, but not in middle/junior high or elementary school library media centers. While the loss rate reduction can be documented and held at

a low level over a period of time, the high initial cost is still a factor in the installation of systems. No research studies have analyzed the public relations factor, yet, security systems do not appear to be a detriment to use of the media center, and, in fact, may encourage use since needed materials can be located a greater percentage of the time. In one school district two security methods have been used: an automated security system in place in one high school and the use of inservice with students substituted for the electronic "search"in the other. In both schools, the results have been the same so that there is very little loss.

CONCLUSIONS: Automatic detection equipment is in place in many places where loss rates have been high. Continued use is very probable since savings can be documented. However, schools unable to make the initial investment may be able to use inservice with teachers and students rather than technology to reduce losses, and this might be an adequate solution to high loss rates.

INFORMATION RETRIEVAL:

The development of a card catalog on a microcomputer using software such as Computer CAT represent the beginning of a trend. This particular program is the first reported "stand-alone" on-line computer catalog for a school and the trend toward automated catalog data is likely to continue.

Access to dial-up information systems seems to be quite common from districts through the state network or the State Department of Education. Maryland is a good example of an effective use of data bases especially when teachers have been given careful inservice training to match the access. ERIC is the most common data base available, and the use of other systems may require a fee for the service.

Interlibrary loan systems are available to schools. If schools are not already a part of computerized networks, the first step seems to be the creation of a union list of materials. This can be done through the use of an OCLC terminal and the creation of union lists on microfiche. The local mainframe can also create union lists similar to the microfiche listing of all holdings in Pinellas County, Florida which is available in all schools in that district.

The addition of the professional library titles from four large county collections in Maryland to the state's database, MICROCAT, allows any Maryland district collection to be accessed and places the county system in the position of being a lender rather than a borrower. Access to collections through microfiche listings of the holdings appears to be a trend.

The use of microcomputers for electronic mail and for reference queries is beginning. However, the telephone remains the most popular technology for interlibrary loan.

Teleconferencing may continue to be a problem since some school districts are served by more than one telephone company.

CONCLUSIONS: Access to data bases for information retrieval is very common and is usually available through district or state networks. It seems to be very successful when accompanied by inservice training for users.

The fact that the smallest school district in the survey considered itself a lender rather than a borrower may help prove to some skeptics that size is not necessarily an indicator of the potential contribution of a school district to a network. Certainly the membership of any school or district in a computerized library network greatly enhances the potential for interlibrary loan.

BUDGETING AND STAFFING:

These two have been placed together because of the lack of information available. While some school library media center budgets are maintained as part of the acquisition of materials and equipment process, most budgets and staff records which are available on a district's mainframe or may be generated for a district through a state computer center, are general rather than specific to media center operations. The amount of detail generated with the budget appears to be in a direct proportion to the size of the budget. Since school media centers are not the most heavily funded areas of the school program they may often be "half a page" in the printout. Even when some types of budget information are generated for library media specialists, most prefer to keep manual in-house records. Some respondents considered that the amount of programming necessary to produce detailed library media center records would not be cost accountable.

Staff records are usually made up of general information such as salary or days available for sick leave. Staff evaluations are not maintained on a computer.

CONCLUSIONS: There is little use of advanced technology in the maintenance of budgets or staff records.

OTHER FUNCTIONS:

Communication between school media specialists and other members of the school community can be greatly enhanced by the use of technology. One communication device is cable television.

Some school districts are beginning to plan to share data with cable systems, and others have begun, but the use is not widespread. Library media specialists are involved in the programming and the

provision of necessary equipment rather than using this technology to respond to reference questions or to provide videotext transmission.

Some schools have made use of cable to cut down on transportation and travel between buildings. By use of cable television, the superintendent reports to the teachers in their buildings rather than bringing teachers to a central location. Some schools use cable television to provide educational programs for groups of rural students in their buildings rather than transporting the students to a central location.

One unique use of cable was reported. This was the use of this technology to preview of materials. While not a trend, the potential is great. It seems appropriate to report this use of technology. Cable television for preview could decrease clerical time in scheduling preview among buildings, or travel costs and time in bringing teachers and media specialists to a central location. Another less well defined savings would be in the possible loss or damage to the material. Such ease of preview might also encourage more effective analysis of the potential for educational audiovisual media.

Satellite transmission, though used very little by school districts or states in the survey has much potential.

CONCLUSIONS:

The role of cable television in the administrative functions of the school library media center has not been fully developed. While its potential is apparent, development is slow because districts cannot provide cable for all buildings. Districts have no access to cable or districts may have access to two or more cable companies.

Satellite technology is a very recent; however, this technology may be able to provide transmission to those schools within a district which are not able to receive cable.

ENCOURAGING THE USE OF TECHNOLOGY IN SCHOOL MEDIA CENTERS:

If resistance to new technologies in school media centers is to be overcome, effective methods must be planned. State department personnel were asked the methods they were using to encourage the use of technology in school media centers. Their responses are shown below:

1. Working through and with state media associations with
   a. presentations at conferences by state department staff, and
   b. jointly sponsored workshops
2. Meeting with district media directors to discuss technology.
3. Sponsoring workshops for district media specialists within the department and in school districts.
4. Encouragement in the choice of purchase of specific types of technology with state and federal allocations.
5. State level funding of communications lines to state-funded computer centers which are offered at no cost to districts except for time sharing and the district's provision of equipment locally.
6. Provision of guidelines for the selection of microcomputer software.
7. Provision of preview center for microcomputer software.
8. Publication of a newsletter listing professional opportunities for media specialists or information concerning particular types of technology.
9. Discussions during visits to schools.

Using technology to accomplish many of the clerical functions in the school library media center can provide new opportunities for managers of media programs. Technology can expand or replace inadequate manual systems. The potential of saving human time, sharing resources, and creating totally new services should be the first priority of the new technological applications. Recommendations based upon the trends identified follow.

RECOMMENDATIONS REGARDING FUTURE PLANNING FOR THE USE OF TECHNOLOGY IN ADMINISTERING SCHOOL LIBRARY MEDIA CENTERS

From a careful analysis of the trends which were reported as a part of this study, the following recommendations for future planning for the use of technology in administering school library media centers and programs are:

GENERAL

1. It is recommended that information concerning the use of technology in school library media centers, both successes and failures be widely disseminated to school administrators and school library media personnel.
2. It is recommended that journal editors and conference planners identify innovative users of technology for school library media programs who can communicate the long-term benefits to educators.
3. It is recommended that school personnel examine the uses being made of commercial microcomputer software designed for small businesses for its potential use in school library media administration.
4. It is recommended that the various uses of technology in administering school library media programs be considered for their potential in relieving professional staff of clerical duties, allowing them more time to work with students and teachers.
5. It is recommended that school library media specialists:
   - become aware of the potential of technology and be willing to test methods over time to confirm or deny the degree of success and cost benefits.

- become knowledgeable about computer technology.
- be capable of managing the new technologies, including the ability to see their potential, to administrators, school library media specialists, teachers and the school community.
- be willing to accept the responsibility for the selection of appropriate hardware and software, organization and retrieval of programs, and maintenance of computer hardware.
- be willing to plan and implement programs designed to develop computer literacy for both students and teachers.
- be willing to develop or assist in the development of appropriate computer programming or software.

6. It is recommended that State education agency personnel assume responsibility for encouraging the placement of new technologies in school library media centers and for encouraging the expenditure of funds for this purpose.

7. It is recommended that research be conducted prior to and after the adoption of technological systems to document the extent of success or failure and the actual savings in time or money.

TECHNICAL SERVICES

8. It is recommended that an indepth analysis be made of the relative cost of processing materials using such methods as:
   - OCLC
   - Commercial vendors
   - A district managed computer system
   - Traditional manual cataloging
   - Word processors

9. It is recommended that schools or districts begin to automate their catalogs by indexing parts of the collection, e.g., audio-visual materials.

10. It is recommended that clearinghouses be established to facilitate exchange of microfiche records of holdings of libraries in school districts not participating in on-line retrieval systems.

11. It is recommended that a list and description of "spin-offs" from districts using computers to catalog materials be published to help other school library media specialists make more effective use of data bases.

12. It is recommended that a computer programmer position be assigned to district library media centers to assist in the development and use of software to meet needs relating to technical services.

SCHEDULING

13. It is recommended that microcomputers be tested as an effective aid to scheduling software and hardware.

CIRCULATION

14. It is recommended that micrcomputers be used to generate overdue notices as an initial management function.

SECURITY SYSTEMS

15. It is recommended that districts investigate (1) the actual savings in book and other material loss as compared to the cost of the security equipment, (2) patrons' feelings toward these systems, and (3) the possible use of inservice with students and teachers to reduce losses.

INFORMATION RETRIEVAL

16. It is recommended that "stand-alone" on-line computer catalogs be investigated as one possible substitute for traditional card catalogs.

17. It is recommended that more information be collected on the use of data bases for bibliographic and information retrieval in school districts and States to determine:

a. Which bibliographic data bases are most cost effective?

b. Which data bases are needed and used by teachers and/or students and for what purposes?

c. What types of students use data bases?

d. Does inservice training contribute to the effective use of data bases?

e. Should users bear a portion of the costs of more expensive data bases?

18. It is recommended that administrators encourage the participation of school districts in resource sharing among schools within a district, among schools in other districts, and among other information agencies.

BUDGETIN.

20. It is recommended that school library media specialists explore the potential uses of computers for budgetary control.

OTHER FUNCTIONS

21. It is recommended that new and innovative uses of cable transmission be reported in the literature when such information becomes available.

22. It is recommended that satellite transmission be considered when cable links are not possible to provide equal services to all schools.

RECOMMENDATIONS FOR STATE EDUCATION AGENCY PERSONNEL AND PROFESSIONAL ASSOCIATIONS

23. It is recommended that the model for cooperation between the Florida State Department of Educatioand the Florida Association for Media Education be utilized by those who wish to increase the potential utilization of technology in school library media centers.

Creative school library media specialists and supervisors of media programs have been very imaginative in developing methods to use technogy to its fullest potential. In some cases, they have exploited the technology and accomplished more than the equipment or the software was originally designed to accomplish. The desire, the ability, and the accomplishments of those persons have allowed school library media centers to enter the field of high technology.

The use of technology can provide school library media specialists time to assume a more active part in curriculum development. Technology may indeed be the best means to allow school library media speicalists time to help teachers teach and students learn. The challenge is there for all.

APPENDIX A

CASE STUDIES

Personnel in nine state departments of education, nine local district or regional centers, and one university center serving local schools were interviewed to determine the current use of technology, the kinds of technologies, and the methods of use. State department of education personnel discussed various activities which were on-going within their states before the nine local sites were selected.

Technologies to be surveyed were chosen after a review of the literature and discussion with team members and project monitors. Technologies discussed included 1) computers of all types, 2) terminals (OCLC, etc.), 3) telephone/teleconferencing/teletype, 4) memory typewriters, 5) word processors, 6) videotext, 7) microforms, 8) satellites or cable transmission, and 9) reprographics such as copiers and ditto. As previously pointed out, the ten administrative categories were: technical services including shared cataloging and acquisition; scheduling of films and equipment or equipment maintenance; circulation; interlibrary loan; information retrieval (data bases); security systems; budgeting; other clerical functions; and staffing.

In querying the state department of education personnel, the following questions were asked:

1. What technologies are currently being used in your state?
2. How are they being funded (soft versus hard money?)
3. What cooperation exists in a technological mode between schools and public libraries?
4. How is your agency encouraging schools to use new technologies from the state level?
5. What are the trends in the use of technology to advance school library media programs?

When the school district or regional level persons were called, they were asked the following questions:

1. What technologies are you currently using?
2. What caused you to start to use this/these technologies?
3. Do you consider your advances in technology a pioneer operation in your area?
4. How has the use of technology improved services to patrons?
5. Is the use of technology contributing to the streamlining of your operations? Do you have actual evidence of its providing more time to devote to programs?
6. What are the major problems with adapting and adopting a new technology?
7. What do you see as the future of technology in the media center?

For each case study reported, a chart is shown illustrating the use of technology throughout the state and the specific types in use in a particular school district or regional center.

ALABAMA

The importance of the use of technology in education was recognized early by educators in Alabama. It was the first state equipped to use television as a part of its instructional program and today has nine stations beaming from sunrise until midnight. Seven studios give technical assistance to schools by providing a dubbing service for tapes to the 80 per cent of the schools having playback capability. Between 30 and 35 per cent have production capability, and five districts are responsible for free channels within their cable systems.

Alabama operates its 1,366 public schools through 127 local school districts. Of these schools, 1,268 have centralized library media centers. Although, the general use of technology for the

management of school library media programs may not appear to be as advanced in this state as in some other states, one aspect of technological use, the word processor, has been heavily used. At the State level, a Learning Resource Center is maintained with special collections of films and a large number of instructional kits for migrant education, special education and drug abuse programs, among others. Inventories of these materials are maintained, instructional catalogs are developed and scheduling is carried out by means of a word processor. The State Education Agency is participating in Project BEST and using electronic mail to store and disseminate information.

The largest portion of funds expended for education in Alabama, 65.7 per cent, comes from the State, with 19.5 per cent coming from local support and only 14.8 per cent from Federal funds. For this reason, State Department of Education personnel have not been in a position to encourage extensive use of innovative technologies. Purchase of equipment is a local option, and any new technology that is funded is done so most often from hard money. Some Federal programs such as ESEA Title IV-B and IV-C have made funds available to districts to explore the possibilities of technology. Microcomputers which were purchased from Title IVB were used in math and computer science rather than by library media personnel. However, approximately fifteen schools have federally purchased microcomputers which are located in the library media centers.

No schools have security systems. Staff in one school district investigated the possibility of using Title IVB for a security system, but dropped the idea when they found out this was not an eligible expenditure of the funds.

Very few school systems have their technical services on computers; however, a consortium of libraries exists in Northern Alabama. Eight school districts and the Alabama Public Library Service were involved in this consortium which uses a computerized cataloging system similar to OCLC.

Another ten system consortium with Auburn University shares audiovisual resources. The scheduling of materials, maintaining of inventory, and printing of catalogs are all done on a word processor. The Director of the Learning Resources Center has created some exciting uses of fifteen word processing terminals, eight microcomputers, and a minicomputer. The week before the interview, a personal computer had been added to this collection. There are also two mainframes that are available to the center.

The system was put in place with little thought of developing a network because Alabama, being a poorer state, does not have the funds to purchase the necessary equipment to interconnect the components of a network, although the network concept is being studied by the state. Programs developed at Auburn were planned for applications which would be useable in schools with stand alone capability or a single terminal.

Original cataloging is done for the Learning Resources Center by the cataloger who inputs information onto the word processor which, in turn, generates the necessary cards for the material. Presently they are planning to connect a "DIALOG-type" service by entering all the items in the Learning Resource Center collection. Users will then be able to call up materials on a specific subject for a particular grade level and so forth. Once these materials have been entered, a sub-routine will place the materials on reserve and

another sub-routine is planned to handle circulation. It is expected that this system will be in place in the coming year.

At present, students handle their own circulation of materials by typing their names, addresses, and the code numbers of each piece of material they wish to check out onto a word processor. The word processor stores this information, tabulates the numbers of materials in circulation, erases the borrower's name when the material is returned, and activates an address label for overdues. This present system will handle up to 800 circulations per day.

Ten school systems formed a consortium, pooled a percentage of their Title IV-B funds and were awarded an additional IV-C project. Approximately $600,000 in materials were purchased. These are circulated from this Learning Resources Center with a word processor.

The unique part of the ten school systems in Alabama's ESEA, Title IVB project for the past three years was their participation, using a portion of their allocations, in this consortium program designed to increase the usage of media in the classroom. This goal was accomplished by:

1. Establishing and circulating learning materials for use in the schools upon request to the ten systems involved.
2. Involving K-12 classroom teachers, media specialists, and supervisors from the systems in the preview and selection of the materials to be put in the collection. (At least one teacher, media specialist, or supervisor from each school system participated in the selection.)
3. Computing the base-line data that reflected the cost per usage of materials used in the classrooms.
4. Conducting staff development sessions with supervisors, teachers, and library media specialists as requested.
5. Preparing guidelines and a model for developing multiple school system media services.

One of the major problems in increasing the use of technology in school library media centers in local schools is money. School library media specialists must convince someone to purchase the necessary equipment.

A second major problem is the people problem. Mathematicians, in the beginning, tried to convince other educators that only the math department was capable of handling the computer. The word processor was chosen for the center at Auburn because it did not appear to scare people as much as computers. A user pushes one button, the word processor completes its command and stops.

The third major problem is software. Unless a school library media center has a programmer on its staff, software is severely limited to what is commercially available. That is not to say that media specialists should learn to program. Their first obligation is to know how to choose hardware and software; however, programming capability will be an important asset for school media center operations in the future.

Several other uses of technologies demonstrated at Auburn have applications for schools if not specifically for most media centers. For those school library media specialists with responsibility for the printing operation in their districts, the local management system for the University Print Shop at Auburn is being put on the word processor. The word processor schedules all jobs, handles inventory control as supplies are used, reorders needed materials, and automatically bills departments.

The Director of the Learning Resources Center does not anticpate any major changes in the immediate future. "One of the reasons we haven't got more into computers, if you get the right word processor you can do almost anything you want to on it."

ALABAMA

FUNCTIONS	Computers*			Terminals			TECHNOLOGIES										Comments
	MA	MI	MC	OCLC	Data	Other	Telephone	Teleconf.	Teletype	Word Processors w/micro-computers	Videotext	Microforms	Satellites	Cable TV	Reprographics	Security Systems	
General Use					[#]	(Data base of L.R.C. holdings for retrieval by grade				#				*			Administration functions o: print shop
Tech Acq										#							
Svcs Cat	*									#							
Scheduling										#							
Circulation Checkout										#							
Statistics										#							
Overdues										#							
Interlibrary Loan										#							
Information Retrieval																	
Security																	
Budgeting																	
Staffing																	

*MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed (via university Learning Resource Center)
[ ] In the planning stage

COLORADO

Colorado has 1,422 public and nonpublic elementary and secondary schools in 181 operating districts plus 17 Boards of Cooperative Education Services (BOCES). These agencies use a wide variety of educational technology in instruction and to a lesser degree in school library media management. A number of school library media centers use computer technology in shared cataloging; four or five districts and several larger BOCES use OCLC. Three western library systems which include school members operate a processing center on OCLC. This center began as an LSCA project..

Colorado schools use computer technology more frequently for student or teacher scheduling rather than for equipment management or film distribution. The larger systems with main frame capability include some library operations such as maintaining the school district library budget. For school districts unable to afford a mainframe for their administrative use, the Colorado Department of Education's School Finance Unit has encouraged them to consider a microsystem for management. One company has been demonstrating their product, Apple-Bud, to smaller school districts who are unable to afford a mainframe. For many schools using microcomputers in their computer literacy program, this would mean only adding to their present systems. Circulation and the card catalog for one school is on a microcomputer.

The Regional Service Systems do all of the interlibrary loans. An electronic terminal network connects the system headquarters with the two major resource centers, the Denver Public Library and the University of Colorado at Boulder. They are also connected with Bibliographic Center for Research (BCR) for more elaborate searches.

Daily messages go to the Denver Public for films, and other materials are requested from Denver, Boulder or BCR. Other information retrieval is done through the academic libraries when requested with searches of data bases paid for by the person or agency requesting the search. The University of Colorado runs a large educational media service including a microlab to produce microforms on a cost plus basis. This school has a very active interlibrary loan program and made net loans of 1,200 items to schools the previous semester.

A wide variety of other technologies used by schools include teletypes (although the equipment is antique and is used more often as a terminal or interlink), electronic terminals for interlibrary loan, cable television, and microlabs.

Cable television is available to schools in Colorado. The Denver Public Schools do programming over Cable Channel 6. This is presently for instructional support and not for information retrieval.

A major problem inherent in initiating and/or expanding technology in the management of school library media centers is the availability of funds. The disparity in funding between districts is common. Small rural schools have very limited funds to purchase advanced technology for their media centers. The cuts in federal funds which will deprive school personnel of discretionary funds should make competition for local funds very difficult for all school districts and thus retard implementation of technologies even further.

Adams County, Colorado, School District #12, a runner-up in last year's Encyclopedia Britannica competition for the School Media Program of the Year Award, uses OCLC for shared cataloging through BCR. The district is able to secure cataloging records for about 40 percent of its audiovisual materials.

Films are scheduled on an inhouse micro with a newly developed program which is being piloted there and in Connecticut for Research Technology Incorporated (RTI). RTI is doing all the programming. It is the first time this company has tried scheduling on anything smaller than a mini. A commercial microcomputer with a 10 megabite Corvus hard disk will allow scheduling with a year round calendar, or at least for 250 days in advance. Four functions of this system are advance scheduling, data base maintenance, traditional reports concerning scheduling, and information concerning the role of materials in outcome-based education.

This school district has a complete set of instructional objectives for each curriculum area. The microcomputer system will permit the correlation of individual films to specific instructional objectives. The first subject area to be correlated is math, and the math films are currently being keyed.

One high school with 2,000 students has written a Title IVC proposal in cooperation with BCR to develop an on-line union catalog for the entire district which will be piloted at this high school.

Interlibrary loan through OCLC has broken, to some extent, the reluctance to becoming involved in interlibrary loan and networking. In this district the gifted and talented programs needed materials in excess of what was available locally and used the district's OCLC interlibrary loan capabilities. This use also tended to break down barriers to using interlibrary loan programs. As mentioned above, access to increased locations for interlibrary loan has been a very positive factor in making this service successful. It has opened up the door to research throughout the United States and has streamlined operations. This district has created an excellent chart which

explains the interlibrary loan potential by locations. A copy of this chart may be found in Appendix C.

The school district has arranged, through an independent research consultant, for data base services. The Supervisor of Media Services recently attended a Bibliographic Research Services (BRS) workshop at BCR to see if the present arrangement is still viable for access in the district or if a change should be made.

One of the two high schools in the district has installed a security system while the other has combatted the problem with a program for students in attitudinal change. Each school is satisfied with the results of its approach.

All word processing equipment is at the administration building with the media center not having a high priority for using it. The central media center does own its own IBM mag card typewriter.

Since the district has adopted zero-based budgeting, programs, including the media program, are required to be cost accountable. The district started with a basic accounting program with limited space allocated to sub codes. Some sub-headings are presently used to provide the amounts of money spent on periodicals, reference materials, other print and nonprint materials, and supplies. Needed, by not available presently, is the analysis of staff time by functions.

Cable television offers much potential for data transmission. Currently three of the five municipalities in the school districts have awarded contracts for cable television and are working on interconnects. Cable has the potential to revolutionize delivery of instruction in terms of distribution of material. With outcome-based education, a new term for competency-based education, instructional

objectives are written which all students are expected to achieve within varying time elements. Basic resources are tied to these objectives and the delivery of the material will, in all probability, be on cable; in the case of twenty elementary teachers needing the same material, either more materials must be purchased or the information could be transmitted over cable on a given time schedule.

Cable will also be a conduit for the distribution of instructional programs such as the Plato Project which is a form of data transmission. Instead of using a telecommunications line, a compatible system throughout the entire district could serve schools in the five cities with the cable being the conduit.

Interfacing the different types of technologies provides additional potential uses. The interfacing of the videocassette or the videodisc to the microcomputer has already been demonstrated. This will provide very specific access to materials to meet instructional objectives.

Technology has improved services in this school district. While elementary school media processing had been done in the past, joining BCR and using OCLC has freed secondary school media specialists from cataloging responsibilities and has "allowed them to get out in front and work with teachers and students." This required a real role change for these professionals and required inservice to involve them more directly in the instructional process. "Technology usually does what it is supposed to do. The human adjustment element is the primary problem."

A DB Master program on an Apple II Plus generates bibliographies of the professional collection which, prior to this had not been heavily used. Bibliographies are handily revised and information on the collection is easily kept current.

Shared cataloging with OCLC was implemented in November, 1978. For the first 18 months it was not functioning up to expectation. It took that long to be comfortable with the system. The turnabout time during the three-year period has dropped 85 percent. At one time, with the manual system, turnabout time was three months. It is currently down to 10 working days. Processing has been expanded by 59 percent in volume, and it has provided for some staff reduction through natural attrition.

Savings have occurred with shared cataloging. The first year, it cost 20 percent more to go onto OCLC than it would have to hire the staff necessary to handle the additional work created by adding the high schools. The second year it cost 19 percent less and the third year it has resulted in a 41 percent savings. Had the former system remained, the increases in salary, cost of living and fringe benefits for staff would have been critical. The district has been able to pay the increased communications costs and still spend less than to pay increased salaries. Thus, the increase in technology is less than the increase in personnel costs. This has also permitted the utilization of remaining staff in very different ways.

OCLC has allowed the Media Services cataloger to expand her professional role. Since the cataloger does not operate the OCLC terminal, this person now functions more as an information retrieval specialist. She is presently doing the system's interlibrary loan and will do the data base searching if a change occurs from using the present consultant.

One major problem is the human element in overcoming the threat of technology. Another major problem was the organizational element. Often the money needed is available, but in the wrong

category. That is, funds are available in salaries when they should be in capital outlay.

A third major problem is of a financial nature. Media specialists must have start-up money to activate a program before any savings can be generated which may be "down the road." Media professionals have enjoyed a certain dependence on Federal money in the past which is no longer as available.

COLORADO

FUNCTIONS	Computers*			Terminals			TECHNOLOGIES										Comments
	MA	MI	MC	OCLC	Data	Other	Telephone	Teleconf.	Teletype	Word Processors w/micro-computers	Videotext	Microforms	Satellites	Cable TV	Repro-graphics	Security Systems	
General Use	# (to develop on-line union catalog through BCR)									#				[#] *			
Tech Acq			*														
Svcs Cat			*	* #													
Scheduling			#														films
Circulation Checkout			*														
Statistics	[#]		*														
Overdue			*														
Interlibrary Loan	*			#	*				*			*					Regional Headquarters
Information Retrieval			*		*												Card catalog on micro. Contract with academic lib
Security																	
Budgeting	* #																
Staffing																	

*MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed
[ ] In the planning stage

FLORIDA

At least one-half of the 67 school districts in Florida have central processing centers, and a few are using computers for cataloging. One large system, Pinellas County, maintains its acquisition system on a mainframe and has created a data base for the holdings of all the library media centers in the district. Each school receives a microfiche copy of the holdings. In addition, through the computerized acquisition system both budget printouts and order status reports are available for all media centers.

No schools in Florida use OCLC and none belong to SOLINET. OCLC costs via SOLINET are very expensive, and apparently SOLINET is not actively encouraging school participation. One school is in the process of obtaining MiniMARC for its cataloging.

All large districts schedule films through the district mainframe computers. Sarasota County has computer terminals in every school and personnel book films directly from their own terminal. Pinellas and Orange Counties provide teachers with microfiche film catalogs made possible through the computerized film holdings.

Some county media specialists use computers to schedule equipment use, maintain a parts inventory, and to record equipment maintenance. Most districts keep equipment inventory records on computers because the state requires that a central office inventory be maintained of all equipment which costs over $100. All districts without computerized equipment inventories are developing them.

No schools are currently using computerized circulation systems; however, many are beginning to use microcomputers to generate overdues and keep utilization statistics. In some cases students in the math labs are writing the programs for these microcomputers.

Interlibrary loan activity is generally accomplished through traditional methods. School personnel are encouraged to use the Florida Library Information Network (FLIN), part of the State Library, but it may be accessed only through a public library. The use of FLIN is uneven.

Data base utilization in school districts is limited to ERIC; however, at the state level, the Public School Resource Center provides access to several other data bases.

Many schools have security systems and the State Department of Education is encouraging inclusion of them in the design criteria for all new high school buildings. State safety officials object to the requirement because the systems may be in violation of state laws concerning egress by the handicapped; however, this objection may soon be corrected.

At the district level, budget information is on computer printouts provided through district management information systems. Some local schools also have budget information on their building microcomputers.

Computers are under the jurisdiction of the Office of Educational Technology which is directly under the Commissioner of Education. This office has contracted with the University of South Florida to establish the Florida Instructional Computing Resource Center which will evalute and review both hardware and software and will set up a software clearinghouse.

Staffing information is available through the data management systems in many districts. All media center statistics such as those dealing with holdings, expenditures and staffing are included in the records held by the State Management Information Services. This

information is transferred from some districts to the State Department of Education via the computer.

Equipment which provides for automatic duplication of information is more likely to be available in a central school district office rather than a school. Memory typewriters and word processors are available in many school districts are also located in central school district offices. In some schools, word processors are a part of the microcomputers in the school media programs. Printing services are a part of the respon- sibility of the media specialist in some districts.

School districts make extensive use of cable television for instructional purposes. In one district, each teaching station has access to instructional television. Micro-dish relay of the television signal is used to reach a wider area.

Most technology for school media center management is purchased through "hard" money accounts. Microcomputers purchased through ESEA Title IV-B have been used for instructional rather than management purposes.

Cooperation between the public libraries and school library media centers in a technological mode is virtually non-existant. Any cooperative arrangements are very informal.

The State Department of Education encourages the utilization of technology in the management of school library media centers through the state media association, Florida Association for Media in Education (FAME). State Department of Education staff members have provided workshops at state conferences on the administrative applications of microcomputers, programming languages, and computer literacy. FAME, the School Library/ Media Services unit of the State

Department of Education, and the Office of Educational Technology are working on plans for a state-wide conference on instructional computing which was held in Tallahassee in early February, 1982. A meeting was held with state supervisors to discuss future technologies and a series of workshops are being planned for the fall of 1982.

Cooper City High School has a student population of approximately 1900 students and a library media staff of three professionals and two paraprofessionals. Computerized purchasing and processing is done at the district level. Interlibrary loan is limited and is done on a one-to-one basis. A union list of serials exists.

Film scheduling is computerized through the county's Learning Resources Department. Current procedures require a written form submitted from the school for each film request, but plans are underway to tie the minicomputers in the high schools to the mainframe for direct booking.

A locally tailored overdue program for the microcomputer was written by staff with students in the computer math program. The staff estimates that the program has reduced clerical work by 90 percent. The microcomputer produces a monthly overdue list and creates a letter to send home to parents, and prepares an invoice for materials which must be replaced. Some of the overdue process is handled by the mainframe (e.g., address labels for students with overdues.)

Other programs on the microcomputer, some of which were written by students as independent study projects, include circulation statistics for all print and nonprint materials, production requests, and media center equipment requests. It takes only minutes a day for

a student to enter the information and, at the end of each day or month, a printout can be generated. Monthly printouts are included in library media center reports to the administration. The computer is also used to create bibliographies.

Interlibrary loan is limited to the community college library, the university library, and within the school district itself. Arrangements are made by telephone.

Most information concerning the technology was gained through professional reading and attending FAME conferences. The media center staff members have completed 21 hours of inservice training with the math teacher and consider themselves computer literate.

Currently 22 microcomputers are housed in the school. Of this number, one is in administrative offices, one in the media center, and two are in the business education department. The remainder are in computer math. It is hoped that in the future computers can be placed in the wired carrels in the media center. Students may make use of the single media center computer now whenever it is not busy.

The security system reduction of loss was reported at the American Association of School Librarian's workshop. This system is most helpful in reminding people that they have failed to check out materials. The school auditors in this county have commended the system and it has become a basic piece of equipment to be added to any new high schools.

Building budgeting is done through the mainframe at the district level and the media center microcomputer. The media center budget is kept on its microcomputer.

The microcomputer is also used to provide a readability index which is added to the shelf list card for books, texts, and tests.

Prior to the purchase of this program, specially trained parents provided information on the potential grade level of materials through the use of a hand calculator to determine the readability level. The computer has cut the time involved to 60 seconds.

A memory typewriter is available in the school building, but not in the library media center. Rather word processing programs are available on diskettes and are used with the microcomputer. Microforms are used only for information retrieval.

An extensive instructional television program exists in Broward County but scheduling problems have made it easier for the school to borrow videotapes from the County Lending Library and reproduce them. The school media center currently has approximately 200 programs. The center also has ditto and Xerographic reproducing equipment.

One of the major reasons that the media center staff investigated microcomputer utilization for management was the predicted decreased enrollment in the school (minus 1,100) which would result in a corresponding loss of paraprofessional assistance in the media center. The professional staff had traditionally placed their highest priorities on working with students and faculty on curriculum design and did not want to reallocate their time to clerical tasks.

Although student enrollment decreased by 1,100, the number of materials circulated increased by 61 percent the first quarter. Nonprint utilization increased by 89 percent and 24 percent more production requests were filled than the past year.

Inservice education is important in introducing and implementing a new technology. Larger districts are more likely to provide inservice than smaller districts in which media specialists may be

more isolated from contact with other media specialists than in a larger system. FAME is involved in restructuring requirements for renewal of teaching certificates. The organization favors changes which would require a component on the use of computers in education for the renewal of media specialists' certificates.

Currently, information concerning various technologies is fragmented. No clearinghouse system exists for examining commercially produced programs and few critical evaluations are available. Some programs cost as much as $2,500 and it is difficult to consider such an expenditure if preview for potential use is not possible.

Some media specialists in Florida are updating their skills by enrolling in advanced graduate programs in computer science. This avenue appears to be an interesting way for some individuals to update or extend their skills.

Cooper City High School is a leader in technology and in programs within its school district. Many visitors tour the center each year. The proximity to Central America brings international visitors, and adaptations of Cooper City programs are being used in Panama and Costa Rica.

FLORIDA

TECHNOLOGIES

FUNCTIONS	Computers°			Terminals			Telephone	Teleconf.	Teletype	Word Processors	w/micro-computers	Videotext	Microforms	Satellites	Cable TV	Repro-graphics	Security Systems	Comments
	MA	MI	MC	OCLC	Data	Other												
General Use	*		# (genrate bibliographies) [#] (inventory)							*	* #				* (instruction)	* (printing services a part of media services)		
Tech Acq	#[*]	(clearinghouse of micro software to be established)											*					
Svcs Cat	#																	
Scheduling	# *	[#]	[#]			*												
Circulation Checkout	#																	
Statistics	#		*															
Overdues	#		*#															
Interlibrary Loan							* #											
Information Retrieval					*(ERIC, only)								* #		#			
Security																	* #	
Budgeting	* #		*															
Staffing	*																	

°MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed
[ ] In the planning stage

ILLINOIS

Illinois is a State with 1,011 school districts and 4,304 school buildings. Half of the school districts have one or more microcomputers; 200 have PLATO terminals with most in the secondary schools. Microcomputers are usually placed in school buildings for educational use rather than library media management, but they are often placed in the media centers because buildings do not have enough equipment to place one in each classroom.

Illinois has been a nationally recognized leader in library networking through the 18 system libraries. This has traditionally involved public libraries rather than schools even though the networks are called multi-type systems. Among the benefits to school library media specialists are access to all holdings in the system libraries and the Research and Reference Centers. When schools do use system services, few use shared cataloging. However, East Peoria Elementary School District #86 (eight buildings) and Pekin High School District #303 in Tazewell County and Limestone Community High School District #310 and Farmington East Unit #324 in Peoria County cooperate with the Illinois Valley Library System in a shared cataloging project. They use OCLC off-line time for interlibrary loan, shared resources, and the authority files for all acquisition and cataloging.

Films for the 80 plus film cooperatives are usually booked manually although a few co-ops use mainframes. A small percentage of school districts would like to book with a mainframe computer; none of the schools are using microcomputers for booking films.

No schools have automated circulation systems although a few use "Overdue Writer," a fairly low cost commercial system developed for

the Apple II and the TRS-80. This is a small system which will handle about 500 circulations in a week and 1,000 overdues in two weeks to four weeks.

Interlibrary loan is handled through the multi-type systems, 60 percent of which have computer access to their collections and to collections throughout the state. A few schools may have some sharing of materials within the county, but this is handled primarily through the network. Schools with union catalogs and/or on-line access have a higher percentage of interlibrary loan and resource sharing. There is a high level of regional sharing within the systems.

The Lockheed Data Base is available in the Illinois State Department of Education. Funded under a million-dollar National Institute of Education (NIE) project, the Illinois Resource and Dessimination Network is available in Springfield for all State Board Staff. A branch, the Illinois Center for Educational Improvement, in Decatur, an ESEA Title IVC project, does all searching for teachers throughout the State. Requests are submitted directly or through a local school library media specialist for better usage of all available local resources.

The State Department of Education has no statistics on the number of security systems used in schools; those in existence are found in Northern Illinois in Cook County or the surrounding areas.

Budgeting for the school library media centers in Illinois is a part of program accounting through the state-wide system. Approximately 75 percent of the schools have automated programs to generate line items, but the actual printout may or may not filter down to the media specialist.

Staff records such as staff evaluations are being placed on microcomputers. A number of schools have Apple II writers; they are normally found in offices rather than media centers because of the noise.

Some Illinois school districts are a part of the Educational Data Network, a state computer complex for all State government offices. This complex features six IBM 3033s, two IBM 158s, and two IBM 168s. Schools may transmit data and computer programs. The State picks up the telecommunication costs. School districts must have their own equipment, but pay only the costs of central processing.

Much of the technology used in school library media centers in Illinois is being funded through such Federal funds as ESEA IV-B and IV-C; Public Law 94-142 (Education for the Handicapped Act); ESEA Title I; and adult vocational and technical education (AVTE) programs. State money for technology is also available from the gifted and talented program (which is utilized by over 700 of the 1,011 school districts), and from the State communications network. The Illinois State Board of Education provides periodic workshops to acquaint interested persons with state computer uses and information about the state's computer assisted instruction (CAI) repository. Most of the CAI diskettes (30 diskette computer programs for Apple II or TRS 80 Model III) in the state repository are instructional programs and none currently have any specific library management functions.

Although funds for education are being cut in Illinois as elsewhere, the future appears to be one of expansion for computer use in schools. Teachers are making more use of computers, and, if funds permit, microcomputers will be placed in each classroom rather than

the media center. The present inability to place one microcomputer in every classroom appears to be the only reason this piece of instructional equipment is found in school library media centers in most of Illinois.

Glenbrook North High School is one of two high schools which make up the Glenbrook School District in Northbrook, Illinois. This high school serves 2,452 students and has a media center with 15 staff members of which four are professionals. This school has its own IBM 60 and all cataloging and card processing for the media center is done on the minicomputer. Multiple cards are reproduced because of resource centers in various departments. One of the professional staff, a full-time cataloger, is responsible for this function.

Film scheduling in Glenbrook has been done for the past six years on the district's Burroughs mainframe. The district owns 1,100 titles and also places rental films on this system. Scheduling is not on-line but is done through batch processing of punched cards.

The Glenbrook Coordinator of Instructional Materials Services is in the process of installing an Apple II and has purchased a circulation system from a California firm. This system will be used initially for overdues.

Interlibrary loan at Glenbrook is not on computer. Some utilization is made of the local library system but, due to the governance structure in Illinois, this school is not yet a system member, only an affiliate. No database searching is done on a computer.

The Glenbrook media center utilizes a 3M Tattletape Security System. Two years before the installation of the system, the media center lost 2,700 books. Last year the loss rate was 93. Teachers

and students were given extensive inservice before and immediately after installation of the system.

The Glenbrook Media Center budget is maintained manually although all payments are made through the computer. A monthly printout of accounts is given. Since the Coordinator of Instructional Materials Services is responsible for all school book budgets, departments receive hand calculated assessments of their budgets from the media center regularly.

No interlibrary cooperation using technology exists for Glenbrook. Since a modem is available in the media center, membership in one of the library system "clusters" is being discussed. If this occurs, Glenbrook North High School would be the seventh member of a cluster which includes six public libraries, one of which is Northbrook's. If Glenbrook becomes a member, the library media center will borrow resources rather than lend them.

While the Coordinator regrets being unable to have on-line inventory control of books, audiovisual hardware is controlled by computer using a batch processing mode in card format. The media catalog (100 pages in size) is generated from data on punched cards and is batch processed.

Loan services have been improved with the installation of some technologies. Theft prevention has made it easier to provide materials for teachers and students. As soon as the Overdue Writer Program is in place, it will help get materials back faster. Since no fines are charged, reminders are needed to retrieve overdue materials.

The use of the IBM 60 has permitted improvement in the card catalog. Materials can be processed more quickly and tracings are

more extensive than ever before providing better information retrieval.

Twenty-one microcomputers at Glenbrook were purchased from a special fund and are available in the building. Fourteen are in the "Apple Orchard" which is adjacent to the library. They are used mostly for computer literacy in the math department. On one Friday in December, the media center sponsored a "Harvest Day." Teachers found an apple in their box with an invitation to visit the media center and preview the new software there.

Seven micros are located in the media center. Classes are scheduled there for an introduction to a particular set of programs. A paraprofessional is on duty to assist with individual usage when a computer is open. Six of these micros are mostly used for CAI and the seventh is set aside for teacher grading. This micro has a printer. A BLOCKS program is currently on order. This twenty-six disk authoring program with 1,000 graphics will permit teachers and media specialists to design their own learning programs for the microcomputer.

While no word processing is presently in place at Glenbrook, a committee is studying the potential. The media center is responsible for a press--not graphics, just a press.

ILLINOIS

FUNCTIONS	TECHNOLOGIES																		
	Computers°			Terminals			Telephone	Teleconf.	Teletype	Word Processors	w/microcomputers	Videotext	Microforms	Satellites	Cable TV	Reprographics	Security Systems	Comments
	MA	MI	MC	OCLC	Data	Other												
General Use	#	#	#(math literacy) *								*							
Tech Acq																		
Svcs Cat				*														
Scheduling	* #																	
Circulation Checkout																		
Statistics																		
Overdues			* [#]															
Interlibrary Loan							* [#]											
Information Retrieval	#				*	#												Lockheed in DP-I PLATO
Security																	* #	
Budgeting	# *																	Media center responsible for print shop
Staffing	[#]		*															

°MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed
[ ] In the planning stage

INDIANA

The State of Indiana has been in the forefront of the use of technology in school library media centers and in cooperation between schools and public libraries. The Indiana Department of Public Instruction's (DPI) Division of Instructional Media is directed by a former member of the National Commission on Libraries and Information Services (NCLIS) Task Force on the Role of the School Library Media Program in the National Program. The Director is currently the President of the State's computerized network--the Indiana Cooperative Library Services Authority (INCOLSA). DPI and INCOLSA have cooperated on two joint projects. The first involved placing OCLC terminals in eleven school districts to place audiovisual cataloging of small media onto the OCLC data base. The second was joint sponsorship of a national conference on networking.

Indiana has 315 school districts. Twelve currently use OCLC terminals for their processing centers. No school districts use OCLC for acquisition. While automation is used for some scheduling of materials, most of this is in the regional centers.

Although no schools have completely automated circulation systems, many are using microcomputers to generate overdue notices. OCLC is not used as a vehicle for interlibrary loan. School districts may borrow materials through their Area Library Service Authorities (ALSAs) which are jointly funded by the State Legislature and LSCA. It may be more difficult for schools to use the OCLC terminal in this way because it is usually located in centralized processing headquarters. School districts large enough to have central services seldom have them located within a single school building. In contrast, the OCLC terminal for an academic library or

a public library is located within the main building of the library complex while the terminal in most school systems is located away from all media centers making access a greater communication problem.

Database searching is not a new device for Indiana's school library media specialists. The INDIRS project, originated over eight years ago, placed terminals in school libraries as well as academic and public libraries to help retrieve demographic data about communities and counties in Indiana.

Some schools do have dial-up terminals and modems for The Source, DIALOG and BRS. They pay the same fees that other libraries are charged for this service.

A few security systems are found in secondary schools. Many school districts generate budget statistics through their mainframes, but more detailed budget figures are maintained manually within individual school library media centers.

Teleconferencing is used in the State to provide communication links between media specialists. One author of this report was involved in such a teleconference.

Technology has been purchased, historically, through capital funds rather than soft money. While microcomputers have been purchased through ESEA Title IV-B, their use is confined to instructional use by nature of the legislation and is limited to educational rather than administrative functions.

Cooperation between schools and public libraries has been excellent. Much of this is related to the activities of INCOLSA which is a true multitype network. State support provides funds for this network which allows services to be provided for schools at no charge for telecommunications. This not only permits, but also

encourages the membership of schools as well as special, public, and academic libraries. Through INCOLSA and through other projects some LSCA funds are used by the schools. The Indiana Union List is being transferred to COM and will be available to schools.

The Duneland School Corporation was a three-time winner of the Encyclopédia Britannica Award for excellence in school library media programs. The district media center is located in a new building with conference space which is frequently utilized by the district. The Director of School Media Programs at Duneland is a past-president of INCOLSA, and has, in fact, "worked with INCOLSA since its inception, because computers are a fact of life."

Duneland currently has one of the OCLC terminals in use in Indiana schools. They also have their equipment inventory on a TRS 80 Model II, and maintain their textbook rentals for elementary schools on the OCLC terminal.

Interlibrary loan does not take the normal pattern for schools since Duneland is a loaner rather than a borrower. The staff has not had the INCOLSA training to make full utilization of the OCLC terminal for interlibrary loan, but will do so at the next opportunity.

Since the present business manager has not computerized the budget system for the district, the library budget is not automated. Word processors are being placed in the business education department for training, but not in school library media centers. A word processing program, "Scriptsit," has been purchased with the TRS 80 for use at the district media center

The periodical list for the district is going onto the TRS 80 and printouts will be available for all schools. Many periodicals are on microform for information retrieval. Some of the professional li-

brary holdings are available on microfiche and the media center uses a microfiche copy of the LC subject headings.

Schools in Duneland are in the process of being inspected for placement of cable television, but this technology is not being utilized at the present time.

Interschool loan of audiovisual materials has always been available. Schools have owned each other's shelf-list cards for all audiovisual materials for some time. If a media specialist wished materials on a particular subject, it was easy to go to the shelf-list and locate the audiovisual materials available under the Dewey Decimal Classification number. This was, perhaps, not as complete or as effective as automated bibliographies would have been, but has been adequate.

Circulation systems will not go online in the foreseeable future. For a system as small as Duneland, automated circulation is low on the priority list.

Database searching will be installed as soon as the Apple II is ready for use; BRS will be used. No security systems exist in Duneland Schools.

FUNCTIONS	Computers*			Terminals			TECHNOLOGIES										Comments
	MA	MI	MC	OCLC	Data	Other	Telephone	Teleconf.	Teletype	Word Processors w/microcomputers	Videotext	Microforms	Satellites	Cable TV	Reprographics	Security Systems	
General Use				#										[#]			Textbook inventory
Tech Acq																	
Svcs Cat				* #													
Scheduling			#												#		Equipment inventory
Circulation Checkout				[#]													Through INCOLSA
Statistics																	
Overdues			*														
Interlibrary Loan																	
Information Retrieval			[#] (periodical list)		* (INDIRS, DIALOG, The Source, BRS) [#] (BRS)							# (LC Subject Headings)					
Security																	
Budgeting																	
Staffing																	

°MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed
[ ] In the planning stage.

MARYLAND

Maryland has examples of the use of most technologies scattered throughout the 24 school systems. In fact, a recent report showed that there are close to 1,000 microcomputers in the schools. These are mostly for educational use although one county manages film booking on a micro. Two other systems use computers for film booking.

School districts do not have shared cataloging although most have central processing centers. Montgomery County uses MiniMARC. Both Montgomery and Anne Arundel Counties use Baker and Taylor's BATAB for acquisitions. For the past five years, Howard County has kept a record of all acquisitions on a microcomputer by Dewey number and by school. Circulation is not automated.

A one-year interlibrary loan pilot program has been in place in seven of the twenty-four school systems. It is not a high technology interlink, merely by telephone and mail. No additional funds were allocated. State delivery vans carry materials to the individual school's delivery system. A turnaround time of 10-14 days is required for most materials although periodical articles are much faster. In one year, four systems have had over 4,000 requests from 60 schools with an 80-88 percent success rate.

The professional library collections in three counties and the state Media Services Center are being entered into MICROCAT, a microfilm data base for interlibrary loan.

The State Department subscribes to Lockheed's DIALOG and BRS. In the past three years, over 1,000 searches have been made with an 82-88 percent success rate. Articles are supplied when requested. Before establishing this service, extensive inservice was given to both media specialists and teachers. The link to the State

Department is through the system level media supervisor. Montgomery County also subscribes to DIALOG and provides on-line searching.

Three counties have high schools with security systems. One county tried a security system in a junior high, but did not find it as successful as the high school systems.

Television is used extensively for educational purposes. A survey on use shows 475,950 students out of 777,725 were viewing state programs in 1979-1980. School systems are working toward more extensive use of various video capabilities. Production is stressed with students through the State Film Festival.

Teleconferencing has been done at the state level with much success. Teletypes are available in public libraries but they are not connected to the schools. Word processors are available in some counties, and one or two schools are on cable.

The State Department encourages the utilization of technology through awareness workshops in the department and in the school systems. A policy is presently being written for the use of technology in the state. The twenty-four counties are divided among three professionals in the State Department, and these persons are providing workshops and regional programs on technology and other library media programs and services.

The Department is also in the process of updating its selection guidelines to include evaluation of software programs for computers. Computer software is available in the state's preview center although vendors are reluctant to send programs to this center. Also, the Department publishes a newsletter of professional opportunities for library media specialists who wish to increase their skills.

Major problems in getting media specialists to accept technology are no different than in gaining acceptance of any change. Minor problems will arise when trying to interface systems.. Also, many persons do not really know what they want to do and are not selecting the proper technology to meet needs.

Budget reductions may slow the placing of high technology in school media centers, although it could speed it up. If administrators see the potential utilization as a time or cost savings, they will be eager to fund such projects.

The only automated technical services function found in Howard County is the previously mentioned record of all new acquisitions for the district. A computer list of "approved" materials is also generated.

This county uses a microcomputer to book films and to print circulation labels to send prints to the requesting schools. The computer also provides circulation statistics and other management data. Because of this, they have been able to transfer a clerk to other operations. The program for this was written by an inhouse programmer. This collection of 2,500 films was large and they ran into data storage problems. BASIC would not combine sub-routines, so PASCAL was used to write the program. It was easy to adapt PASCAL to the Apple and it was not necessary to go to a hard disc to handle the data.

All high schools and two middle schools have microcomputers to control circulation. Because there was no charge for it, they use the program developed at McGraw University (in Canada) which is in BASIC. The American Library Association is also supplying a program and it may be this same one.

Howard County is one of the pilot districts in the Maryland Interlibrary Organization (MILO), a consortium primarily of academic and public libraries. All schools have microfiche copies of the union catalog. Materials are requested by telephone.

The professional library collection of this county is one of the four on MICROCAT. While no local union catalog exists, the schools do have access to this huge collection.

Information retrieval access also exists through the State Department of Education's data bases. They do not have their own. Through MILO they also have access to OCLC, but access is not online.

Security systems are not used in Howard County. No technology is used to any great extent for budgeting, but they do use short microcomputer programs for budget allocations. The school system's master budget is on a word processor.

Teleconferencing is used for instructional purposes rather than for management or administrative functions. Teletype is not currently being used to MILO, but interlibrary loan has grown so rapidly that teletype has been considered rather than telephone.

Word processors are available in the school systems. They are used, primarily, to update documents. Located in the central office, they are available to the media services personnel as central staff members, but not directly for schools. School personnel could come in to the central office to use if they wished, but word processors are not being utilized extensively by individual schools.

The local company holding the cable franchise plans to initiate a videotext system within the next two years, and media specialists might become involved at that time. Not all schools can be reached by cable, so extensive use has not been made of this technology. Rather videotapes are circulated to schools.

All school media centers do have telephones. Copy machines are available in all school media centers, also.

Microcomputers are within the budgetary range of small libraries and school libraries are in this category. They can perform many functions such as circulation control. Since micros were available for instructional programs, it was logical to overlay some administrative tasks.

The district schools presently use Apples. They also have most of the Minnesota programs which are made available centrally for loan to schools. The district media center also circulates commercial programs which are too expensive to purchase individually.

Use of technology has increased service especially through interlibrary loan. The success rate for MILO is slightly below 80 percent average. It is higher than that for teachers--over 90 percent. The use of microcomputers can be a time saver for circulation control.

Once a union list for the system exists, interlibrary loan within the system will be available and the value of membership in MILO may decrease. Materials in the district will be able to circulate more rapidly and will also then have heavier use which would be a very positive report to present to school administrators.

A problem in adapting a new technology is that people are reluctant to jump into things they do not understand. This was true of microcomputers. Students love them, but media specialists are a lot less eager. It doesn't take long if good inservice support exists. Programming is also a problem--writing or having written the programs you need.

For small districts without extensive staff, simple inservice will get the media specialists to be willing to assist students and teachers. Vendors may be also able to help overcome resistance. Vendor assistance in "selling" a system to reluctant media specialists, students, and teachers might be written into the request for bid at the time of the initial purchase of a system. An important consideration for any inservice training session is to have enough computers to permit all participants to have a hands on experience with any training session.

MARYLAND

FUNCTIONS	TECHNOLOGIES																	
	Computers*			Terminals			Telephone	Teleconf.	Teletype	Word Processors w/micro-computers	Videotext	Microforms	Satellites	Cable TV	Repro-graphics	Security Systems	Comments
	MA	MI	MC	OCLC	Data	Other											
General Use			*					* #		* #	[#]			*	#		
Tech Acq	* # (Computer generated list of approved materials)																BATAB
Svcs Cat												* (Minimarc)					
Scheduling			#														Films
Circulation Checkout			#														Also prints film circ. labels
Statistics			#														
Overdues																	
Interlibrary Loan							* #										
Information Retrieval					* (BRS, DIALOG)							* (Microcat)					
Security																*	
Budgeting			# (budget allocations only)														
Staffing																	

*MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed
[ ] In the planning stage

MINNESOTA

Minnesota appears to be the foremost state in the development of microcomputer programs for instruction in its 434 school districts. The Minnesota Educational Computer Consortium (MECC), created through State funding in 1973, has been responsible for the creation of two major computer support systems for the schools: (1) an on-line time sharing system (known as MTS) and (2) a system to support microcomputers through the creation of software and the advertising for a statewide bid for hardware. The primary purpose of MECC is to assist member systems in the coordination and utilization of complete resources through a cooperative planning and decision-making structure. The presence of major companies such as Control Data Corporation (CDC), SDC, UNIVAC, and IBM, all of which have headquarters in the Minneapolis/St. Paul area, have helped to generate enthusiasm for computer literacy from parents and from teachers and students in schools.

The time share system (MTS) furnishes the state with both instructional and administrative programs (e.g., district budgeting systems are available through MTS) and supplies the school library media centers with monthly printouts which give the status of the budget but do not record actual purchase orders. The budgeting system is supplemented by more detailed hand-copied records in building level library media centers.

Another administrative program available to school library media centers through MTS is the SEARCH system, originally developed in Rochester and now available through MECC. This system allows schools to enter bibliographic data to create a state on-line catalog of library media center holdings. The telecommunication costs, however,

are prohibitive and school use of this system is not likely to develop in the near future although public and academic libraries are beginning to use it.

The other MECC system--microcomputer software and hardware support--is available to many schools and library media centers throughout the state. To date, the software is almost all instructional in nature and, is, therefore not the province of this report. If MECC distributed microcomputer software were to be created for library media center management functions, it would instantly become very popular.

In the area of hardware support, MECC has supported the purchase of the Apple; however, Atari computers have recently won the state bid. This process has allowed the cost of computers in Minnesota to be the most reasonable in the nation. Originally MECC handled all microcomputer purchases; however, when the change was made to Atari, a list of distributors who would offer the state bid was distributed so that school districts could purchase locally.

In other areas, the general impetus for using computer technology in school library media center administration has not reached technical services. Only two school systems, Rochester and its neighbor, Austin, have OCLC terminals, although one elementary school on an Indian reservation uses the OCLC terminal in a nearby community college. All three locations are members of MINITEX, the state's computer network.

In the southwest section of the state, 81 school districts have a shared acquistions program. Orders are pooled for the purchase of equipment and nonprint items. This is done manually.

Circulation systems in Minnestoa school library media centers are not automated, but some library media centers are generating computerized overdues. Interlibrary loan is in its infancy, starting with the new multi-county/multi-type legislation which was passed in 1978. Regions are just beginning to organize.

Data base searches are available through the State Department of Education on Dialog, but this service is not part of the multi-county system and is not well known. Searches are also available through universities. The fee charged by the State Department of Education for ERIC searches has discouraged use.

Several districts have installed security systems in school library media centers, and they have apparently been quite successful. The Austin schools have kept careful records of the success of their security system, and losses have been substantially decreased.

Three school districts--Red Wing, Cannon Falls, and Northfield--use computers for management. Media centers in these cities received small State grants for planning circulation systems and have used the microcomputer for overdues. Red Wing High School is also using the grant to develop other systems for library media administrative purposes.

Red Wing High School enrolls 900 students; the media center is staffed by one professional and three paraprofessionals. The media specialist reports that the Apple II microcomputer programs he wrote:

- handle a catalog of 2,000 paperback books through the use of accession numbers
- create author and title labels for cards and pockets
- keeps track of both inventory and accession numbers

- produces the catalog for the student's use
- handle overdues.

The first three functions are done on the Apple II with one disk storing the book information and another storing the program. The overdue program has saved at least ten hours of staff time per week. This program alone has saved the total cost of the equipment over four years.

The Red Wing High School library media specialist is a self-taught programmer; he believes that commercial software such as DB-Master and DB-File have potential use in library media center operations and is working to adapt these programs to local needs.

A recent acquisition at Red Wing has been a Corvus disk, a hard disk master storage device. This has been available for only one month but is expected to handle some experimentation such as hooking 20 to 30 Apples together. The media specialist is currently in the process of entering the MECC programs, word processing, and data management files onto the Corvus disk.

This media specialist predicts that tying several small computers into a network will be cheaper than single computer applications. He noted the need for much more hardware since a teacher with twenty-four students is frustrated when only two or three computers are available. He also predicts that public libraries in this state will adopt turnkey systems connected to mainframe computers for circulation and bibliographic data sharing because they do not have access to microcomputers which are available in the schools.

Interlibrary loan, while used personally by the Red Wing High School library media specialist, is not popular with teachers and students. This service is offered through the public library which

is connected to the school only by telephone. Retrieval time--at least a week--is too long, and students are usually unwilling to wait.

Little use is made of data bases. Since a fee is charged for use of the ERIC system in the State Department of Education, teachers no longer use it.

While Red Wing High School does not have a security system, the media specialist is investigating them. The most popular security system in other Minnesota schools seems to be 3M and those using it appear to be satisfied.

Budget for Red Wing High School Media Center is generated by the consortium computer, TIES, a system similar to MECC, but not part of it. A monthly printout updates the status of the budget, but does not record actual purchase orders. A local budget is maintained manually. This function is not considered a high priority as a timesaver.

Few microcomputers are exclusively available for use by the media specialist. A hard sell was required to secure the Apple for Red Wing library media center even though some library media funds were available to assist with the purchase. This piece of equipment has saved money and such savings are being documented.

MINNESOTA

FUNCTIONS	TECHNOLOGIES																	
	Computers*			Terminals			Telephone	Teleconf.	Teletype	Word Processors	w/micro-computers	Videotext	Microforms	Satellites	Cable TV	Repro-graphics	Security Systems	Comments
	MA	MI	MC	OCLC	Data	Other												
General Use	[*]	(online library media center holdings																Paperback catalog #
Tech Acq																		
Svcs Cat			# (paperbacks)	*														
Scheduling																		
Circulation Checkout																		
Statistics																		
Overdues			* #															
Interlibrary Loan	[*]						#											
Information Retrieval					*													DIALOG, ERIC
Security																	*	
Budgeting	* #																	
Staffing																		

*MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed
[ ] In the planning stage

NEW YORK

As was found to be true in other states, the uses of technology for administration functions in school library media programs vary widely through the school districts and 44 Boards of Cooperative Educational Services (BOCES) in New York state. New York has, however, led in the development of pilot school library systems to test and demonstrate methods of resource sharing. In 1978, the State legislature authorized the creation of twelve pilot school library systems to test methods for resource sharing. These pilot projects--located in Rochester, Syracuse, Yonkers, New York City and in eight BOCES regions--are required to establish a delivery system and union catalog to facilitate resource sharing amont its members. Two pilot projects are made up of existing public library systems, 3Rs (Research and Resource Library Systems), and newly developed school library systems. In five other areas, school library systems have been created in preparation for future multitype network participation.

The school projects have used a number of methods in developing union lists including OCLC, BOCES district computer, an Apple II fitted with a Corvus Disk, a public library database and computer generated microfiche. Two of the school based projects initially attempted to use OCLC for shared cataloging but found the cost to be prohibitive.

One project, Putnam-North Westchester BOCES, is developing programming necessary for an on-line circulation system. No other on-line circulation systems are currently in use.

Interlibrary loan is completed primarily by telephone and written request; however, two of the pilot systems use computer-assisted

methods. In Syracuse, a computer terminal in the project headquarter's office is linked to the circulation system of the Onondaga Public Library. Requests which cannot be filled through the school district can be searched through the public library system. Some school districts have requested and filled OCLC interlibrary loan requests.

Twenty-four state-funded school library system "shoe-string" project grants were awarded in January 1982. These one-year projects, limited to a maximum of $10,000 and to BOCES or Big Cities not part of the 12 school library system pilot projects, are intended to assist in the initiation of resource sharing activities. Most of the projects include technology, usually microcomputers, for development of union lists of serials or other resources, intended to meet some instructional purpose.

Technology is being encouraged by the state education agency in several ways. As of January 1, 1982, a Center on Learning Technologies will be formed initially to bring together the current Bureaus of Mass Communication and Educational Communication. The eventual organization and operation of the Center is in the planning stage. The function of this office will be to assist school districts and other educational institutions as they move into the world of computers and technology and other areas. The Spring, 1982 issue of News & Notes, newsletter of the Bureau of School Libraries will highlight microcomputers and their implications for school library media centers. An automation conference sponsored by Library Development/ State Library is scheduled for June, 1982.

The use of technology is not entirely limited to schools within project areas. Data base searching is provided for schools through

Educational Programs and Studies Information Services (EPSIS), a State Education program department, and the State Library. Many BOCES professional libraries provide ERIC documents on microfiche. One school pilot project is using BRS.

A number of high schools use library security systems. Most use the 3M Tattle Tale systems and find it to be satisfactory.

Many BOCES centers and large city school districts have large film collections which are frequently scheduled on BOCES or district computers. Funds and personnel are often the greatest constraints to this usage. The BOCES and district computers are also used for a number of administrative functions including budgeting and personnel record keeping. Some media centers receive monthly print outs of budget status from the building or district print out.

Word processors are used primarily for the production of bibliographies and newsletters.

Each public school in New York State must submit annual Basic Educational Data System (BEDS) forms to the State Education Department. Through these computerized records the Bureau of School Libraries has access to the name and certification data of every school library media specialist in the state. Qualitative collection data for each library and other information on the school is available, also.

Electronic mail experiments are being tried by the Albany Public Library and the Upper Hudson Library Federation. If initially successful, schools may eventually be included in the project. Three of the school pilots are using electronic mail via microcomputers and Guidance Information System terminals for interlibrary loan requests and other messages.

Last year the districts in the state spent $2.9 million on microcomputer technology from ESEA Title IV-B. This was primarily for instruction, but many of the microcomputers are housed and used by students and teachers in the library media centers. In the western part of the state, some Appalachian Regional Commission funds are being used for television technology.

Programming for computers is mostly commercial. Some programming is being developed by teachers and library media specialists, but many of these individuals become frustrated because it takes so much time, and there are not enough terminals available. Some library media specialists have prepared library skills lessons, special bibliographies, independent study courses, and audiovisual catalogs on microcomputers. There is much interest in trying to do inventory and overdues on the microcomputer, but this is not presently in much use.

Awareness training for school library media specialists must be a coordinated effort. State Department personnel believe that they have a responsibility to help school library media specialists to become computer literate. Technology is another instructional resource and media specialists should be aware of it.

Few individual media specialists are aware of or have begun to answer questions concerning the housing and cataloging of software. Software is stored in classrooms or library media centers with little organization.

The Media Director of the Oswego County BOCES is a former member of the NCLIS Task Force on the Role of the School Library Media Program in the National Program. The Oswego County BOCES is a regional service center which, through the Curriculum Resource

Center, provides a collection of films, videotapes, large kit materials, and other materials for the nine rural school districts with 24,000 students serviced. Rather than cataloging, an accession system is used to retrieve materials. Teachers receive a fully-annotated book catalog which, in the past, was produced in part with varitype equipment and in part through contract with a commercial computer service. At present, an investigation is being made of the potential of joining with other BOCES to produce the catalogs by microcomputer.

The center is testing the potential of the microcomputer for film booking by experimenting with computer management of preview films. The current film collection is 2,200 films and the center schedules approximately 600 films for preview each year.

Circulation is not automated in schools in Oswego County. One or two schools have investigated Gaylord, but none currently use this system.

At the present time, OCLC computer tapes of school district purchases since 1978 are with BroDart and will be used to generate a microfiche union list catalog which should be ready in late February, 1982. "The COM catalog will greatly improve interlibrary loan." At this time they are using a paper card shelf list system and the BOCES staff manually search for materials requested by individual districts. There is also a union catalog of serials in use, allowing direct school to school interloan requests.

This BOCES is tied into the State Education Department for on-line information retrieval searches from ERIC. The entire ERIC system is available at the Oswego County BOCES and, when necessary, a manual search can be made. They contract on an "as needed" basis

with a local college, a member of the SUNY system, for on-line searches of approximately twenty additional data bases. Most utilization is made by teachers in special programs such as those for gifted and talented students, administrators, and school board members. Students have access to the service but rarely use it.

One school district within the BOCES area is into its third year with a security system. They are satisfied with the system and cite decreased book loss; however, no careful analysis has been made of ongoing book loss reduction in comparison to the cost of the system. They did much inservice with teachers and students before implementing the system because they chose one that would ring bells. When it was first installed, bells went off constantly. Once students and teachers became used to the system, the media specialist did not feel it affected public relations. This open media center, with several entrances and exits, has become a showcase for other interested districts considering security systems, but no other district media specialists have implemented such a system because of the cost.

All budget reports are on the computer. The BOCES provides shared management services including payroll, attendance, scheduling, test scoring, inventory and others for the entire county through a master computer for the region. Individual school media center budgets are a half sheet on most budget reports because school media specialists do not have sizeable budgets available to control. Another computerized clerical function includes collections inventory. Bibliographies are occasionally produced from this inventory for a newsletter.

The BOCES print shop has completely computer-operated printing equipment. A computer-operated typesetter is now used to produce their film catalog. The print shop is sophisticated and is used to teach high school vocational students.

Personnel records including salary information are on the regional computer. The Media Director uses a dual system and keeps inhouse records for immediate access. Evaluation information about staff is not computerized.

At the present time, two types of microcomputers are in use in the BOCES; they have two timeshared systems, or a total of three systems, in place. These are used 90 percent of the time for instructional purposes rather than administration. One OCLC terminal is located in the BOCES.

The BOCES repairs all equipment for member school districts including one brand of microcomputers. This repair service is designed to facilitate technology installation within schools.

Teleconferencing was used during the time the Media Director was President of the New York Library Association and its use was primarily for state association business. The fact that three different phone companies provide service to this county makes teleconferencing difficult.

Many districts have modems for microcomputers. It is possible to accomplish many networking functions through these micrcomputers. Voice messages are not provided; however, an electronic mail service permits the answering of reference questions. Media specialists or teachers may also ask a question such as "Does anyone have software for teaching elementary industrial arts?"

The Media Director has a teletype in her office, not necessarily for her administrative functions. It is used most often by other administrators in the organization for messages to and from the State Department of Education in Albany. Magnetic Tape System Typewriters (MTSTs) are also available, and word processing programs exist for the Apple IIs. "Pure" word processors are housed in other parts of the building, but not in the media office. Most schools have microcomputers with word processing programs rather than word processors.

The school library media centers in Oswego County schools house about 75 percent of the microcomputers; others are in the district office, math labs, or in the guidance department or area. Administrators find that they need a central location for the placement of microcomputers and their choice is the library media center. Most schools are using microcomputers for instructional rather than administrative purposes at this point. The county has standardized on Apples and TRS 80s so that the BOCES can provide training, technical repair, and software.

The BOCES staff provides training in Basic Programming, technical use, conceptual use (often for school board members and administrators), and actual use of a particular software program to meet the needs of users. They also teach planning for microcomputers in schools.

One-half of the districts in the area are tied into cable which can be used for instructional programming. The BOCES Media Center staff offer many duplication services within the guidelines of the copyright law including off-air recording, video and slide duplication, computer software copying, and duplication of print materials including curriculum documents from the State Education Department.

The BOCES staff believe that the use of technology has improved services to patrons through improved access. It has assured the continuance of services because, once a technology has been inaugurated, it is cost effective.

Increased use of technology has resulted in an interesting side effect--bringing all school library media specialists together in a common cause. They now have an enhanced role in individual school buildings and a feeling of belonging to a larger network that they did not have before. They are no longer isolated and have emerged in a leadership role. Superintendents and principals are looking to them as technology and resource sharing experts. They are now given release time to attend planning sessions. One media specialist in this BOCES area did not retire when she became so excited about the potential of technology.

Major problems in adapting a new technology include overcoming the people problem through appropriate training programs. Individuals are eager to learn, but few inservice training packages are available. Supervisors of media services must create as they go along.

The problem is compounded because there is no differentiated approach to training. An introduction to the microcomputer for the media aide should be different from one for media specialists, teachers, or administrators.

Vendors will often provide workshops with multiple machines at the BOCES, if administrators are in attendance. Awareness demonstrations are offered with single pieces of equipment. Actual training on machines is provided in the BOCES area by a cadre of classroom teachers and media specialists who are available to go from

district to district to do training programs. In the past year and one half, the BOCES has sponsored eleven technology based continuing education courses at $40 for 40 hours of class sessions. "Local credit" can be earned by teachers and media specialists in many districts through attendance at the sessions. A total of 400 of the 1,600 teachers have participated. These courses appear to meet the real need which exists for both training and inservice. Training is necessary especially for new teachers who have been educated in colleges or universities which are not providing computer experiences for teacher training programs.

Most school library media centers are still one-person operations. Library media specialists are excited about the potential of microcomputers, but find it difficult to find time for training while running a basic program.

Start up costs are high when implementing a new technology. Recognizing this problem, legislation is being proposed in New York to provide matching funds to cover costs of initiating new technologies. School districts, in spite of severe economic constraints are providing whatever equipment they can. Technology is almost becoming a teacher-mandated item.

Technology will help media specialists move into a more professional, and less clerical, role. It has the potential to handle administrative functions such as cataloging and circulation. Teachers are excited about the new technology and are delighted when the media specialist can serve as an information source. Teachers are also delighted to schedule children for 10 minutes per day on the terminal.

The need for computer literacy is a basic requirement for persons from kindergarten through 80. School library media specialists must be responsible for helping to fulfill this need in the coming decade.

NEW YORK

FUNCTIONS	TECHNOLOGIES																	
	Computers°			Terminals			Telephone	Teleconf.	Teletype	Word Processors	w/micro-computers	Videotext	Microforms	Satellites	Cable TV	Repro-graphics	Security Systems	Comments
	MA	MI	MC	OCLC	Data	Other												
General Use			* (instruction)	*#(to develop union lists)					#	*(for bibliographies)	#		#(conputer generated)		*	#(print shop computer operated)		
Tech Acq																		
Svcs Cat																		
Scheduling	*		[#]	(currently being tested by booking preview films)														Films
Circulation Checkout	[*]	(one pilot project)																
Statistics																		
Overdues			[#]	(Films planned)														
Interlibrary Loan	*			*			*											
Information Retrieval	*				* #	(ERIC)							[#]	(union list under production)				
Security																	# *	
Budgeting	* #																	
Staffing	* #																	State Department Files

°MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed
[ ] In the planning stage

WISCONSIN

The State School Library Media Consultant for Wisconsin who also served on the NCLIS Task Force on the Role of the School Library Media Program in the National Program reports that, as in other states, computers are in the experimental stage. To a greater or lesser degree, depending upon the school district in Wisconsin, computers are being used, not only for instructional purposes, but also for administrative uses.

Some school districts, such as Janesville, are members of a consortium of all types of libraries, using OCLC for cataloging. Others, such as the Plattville School District, share a terminal for OCLC with the University of Wisconsin--Plattville. Plattville has generated their own profile on OCLC so that cards produced for the two institutions are not mixed.

Microcomputers have been used with limited success for production of catalog cards in Wisconsin. Most school library media specialists seem to be in about the same place in programming and realize that data storage on microcomputers is limited. Even if entries are abbreviated, there is not enough storage available on the 5 1/2" floppy disks. The data cannot be saved for other uses once catalog cards have been produced. All such programming is currently being done locally by media specialists, library school faculty, teachers (usually math), students, and some vendors or sales persons in local stores who are interested in the potential use of microcomputers.

Three districts, Eau Claire, Oshkosh and Madison, do utilize their own computers for cataloging. Madison's system, more versatile than the other two, is also programmed for generating labels, ordering, and paying bills.

Some scheduling of films is automated through cooperative projects. A number of school districts are experimenting in the use of microcomputers to schedule films. In one experiment, the Milwaukee Public Schools and the Milwaukee Museum cooperate in using a computer to book museum films.

Most database searching is done at the state level through the Wisconsin Dissemination Project funded through an NIE Capacity Building Grant project. Part of the Dissemination Project is decentralized through the regional Cooperative Educational Service Agencies (CESAs), and thus is more readily available to school districts.

No automated circulation systems were reported for school library media centers.

Interlibrary cooperation projects include one in Southwest Wisconsin in CESA 14 located in Fennimore. At this CESA, a computer-produced union list of audiovisual materials is available on microfiche. While it is basically the school districts' holdings, it also includes academic, special and public library holdings.

The Educational Telephone Network (ETN), the nationally known telecommunication network, is used to provide inservice education for many groups throughout the state including the public schools. The Statewide Extension Educational Network (SEEN) uses a light pen to draw on a blackboard which reproduces the graphic at the other telephone sites.

Trempealeau County is made up of small school districts. These districts have refused to consolidate but want to cooperate. They requested and were granted Federal Communication Commission (FCC) approval for an interconnected television network in which

transmission can be sent and received from each school in the county. Teaching staffs are pooled and students can be "brought together" without bussing from district to district. School media specialists help operate this technology and make sure equipment works.

Most of the word processors available in the state are are part of the microcomputer systems. If a district purchases a micro, it may also get the word processing program. They are used almost exclusively to list items.

The state library agency, The State Reference and Loan Library, is the single subscriber to RLIN in Wisconsin. In this agency, RLIN is being utilized for retrospective conversion and for cataloging, in addition to current membership in OCLC, in the agency's processing center. If a record is not on OCLC, they search RLIN. The computer equipment at the State Library which communicates with RLIN and OCLC is variable speed so that it can be used to connect both TWX and TWP which are available in the public library systems of the state.

The Southeast Wisconsin Union List (monographs) was developed by the Milwaukee Public Library. While this is available to schools, it is not utilized perhaps because it is a "one-time" list and has not been updated regularly.

The University of Wisconsin Stout has placed its card catalog on microfiche. Copies are sold for a small fee to interested students who have access to microfiche readers in the dormitories. In the future, schools could do this by entering their holdings onto the microcomputer and then generating COM catalogs.

Wisconsin has developed an LSCA project which will establish a statewide database in machine readable format. As a part of this

project, the two school districts already on OCLC would be the first to be entered. In addition, the Madison Public Schools would be included since one requirement for the bid was the understanding that Madison's non-OCLC compatible computer cataloging would made compatible. A major disadvantage of a non-OCLC compatible system is that it does prohibit the district from immediate access to a computerized national network (a problem which would be overcome if the proposed state data base becomes a reality.)

Many school districts in Wisconsin are connected to commercial cable television with a closed loop. The Racine Public Schools have permission from several media producers to preview their materials over cable television. Teachers receive advance notice of schedules and lists of materials available for previewing over cable television.

Eleven schools in Wisconsin have electronic security systems at the present time. Early analyses indicate positive cost benefits of this system.

The State Department encourages the use of technology in managing school media centers its newsletter, School Media News, published twice a year; through articles in the Wisconsin Library Bulletin, the official Wisconsin quarterly publication; and at state conferences where State Department staff frequently make presentations relating to computer applications useful to both audiovisual specialists and school librarians. Also, the Wisconsin Dissemination Project personnel encourage computer utilization on their visits to schools to discuss available data bases.

The Madison Public School Media Services uses a Honeywell 66-10 mainframe for ordering and processing of library materials. The Automated Library Processing System (ALPS) provides for biding,

acquisition and cataloging of materials. Cataloging data for ALPS comes from MARCfiche as well as original cataloging. Orders are submitted from individual Instructional Materials Centers (IMC's) to the district media processing center where the orders are checked against holdings on the ALPS system. If a copy is already available, the identification number is key punched into the computer and the item is automatically ordered. If not, as much information as possible is located on the MARCfiche and input into the computer. The Media Services staff hope to get a data entry terminal to permit the placing of information directly onto the mainframe rather than through punched cards as is being done at the present time.

Two reports are generated on the ALPS system computer: a library purchase status report listed alphabetically by author so that media specialists do not need to maintain an order file at the local school, and charges to the school account. Many of the local library media specialists do maintain manual files in their buildings because they still do not completely trust the computer.

Centralization of the processing center facilitated catching up on an eight month backlog. The center is now on schedule most of the time. During the first computerized year, 90,000 items were processed. A study was made by the Manager of Media Services at Madison of the potential for using OCLC. It appeared to be more costly and the district would lose many of the services now being offered.

In discussing OCLC with the high school librarian in Plattville, he reported getting a 55 percent hit rate for retrospective cataloging of all audiovisual materials. In his district, no audiovisual material had been cataloged previously. Since some forms of media

are missing at the present time, the Manager of Media Services at Madison did not see that OCLC audiovisual materials cataloging would be cost accountable to her operation.

Scheduling of centralized media has also been done on the mainframe in the Madison system since 1975. Approximately 3,500 16mm films and video tapes and 1,000 other types of media such as models and videotapes are booked on the Honeywell. An annotated catalog is generated annually with two indexes, one with broad subject headings (not Sears or Library of Congress headings) descriptive of curricular areas and one with keywords from the title (KWIC). Film titles are altered if not indicative of subject content so that the keyword index is more relevant.

The year after the film and media book catalog of centralized media was generated, as an alternative to cards in the card catalog, use of audiovisual materials doubled and use doubled again the next year meaning that four times as many films and other media materials were used. Plans are to get a terminal for the film library. Punched cards are currently carried to the computer room for entry on the computer.

The Madison School District previews <u>everything</u> it purchases for the central media center and as much as possible for library media centers. Three opinions are strongly suggested before any material to be centralized is purchased. One professional media specialist deals with the preview process of audiovisual material as well as text materials and this media specialist is responsible for all subject headings and descriptive rather than critical annotations for the annual centralized media catalog.

The equipment inventory for Madison is also on the Honeywell mainframe, but it is not very satisfactory or very useful. Once a year a printout is generated and equipment locations can be verified. For example, one cannot easily access the numbers of filmstrip projectors throughout the district or where they are located. The programming was not done with consultations with library professionals, but was done as a general program with all school equipment included, not just IMC holdings.

Interlibrary loan in Madison is informal and does not depend upon any technology beyond the telephone. Substantial plans are underway to expand this through publication of a catalog. An ESEA Title IVC adaptor/adopter proposal has been made to enter the 48,000 audiovisual items in the elementary schools on to the district data base. At present, no one really knows what anyone else has. The holdings information has not been updated. It was decided originally only to input new materials onto the Honeywell. Therefore, while withdrawn materials are deleted from statistics, they remain on the data base. Each school's shelf list must be matched to the computer and either deleted or added as the situation requires.. A book catalog of locally owned audiovisual materials is also planned.

This district has been working with the Southcentral Public Library System to initiate interlibrary loan of 16mm films.

Data bases, ERIC and DIALOG, are searched by the Education Reference Librarian in Madison. She gets a terminal once a week and batches requests for this weekly search.

A cable system exists with cable drops in every elementary and middle school classroom and in the high school IMCS. Two high schools have auditoriums wired for cable. Uses of cable television

include announcements from IMCs, schedule changes, prerecorded programs, and addresses to the faculty by the Superintendent. In high schools with limited cable transmission, the superintendent's speechs and other special video programs are prerecorded.

A word processing department for Madison schools provides automated clerical functions. Twice a year the department produces the Media Processing Department's compilation of book reviews prepared locally and those found in Booklist. Elementary and middle school library media specialists preview books twice a year at the Cooperative Children's Book Center, a joint state-university funded children's research library. If a title previewed by a library media specialist has a district identification number, the media specialist may order the book using a mark sense card. Thus the computer provices data on the status of each title ordered. The word processing department generates monthly statistical reports for media processing from statistics furnished over the telephone by media specialists.

An equipment repair project using LSCA grant money extended the services of the Madison Public Schools' Media Center. The Center now provides repair services to 45 school and public libraries in four counties in Southern Wisconsin. The public library van does the pickup and delivery of equipment. School media specialists may bring equipment to their public library; then the public library provides free pickup and delivery to the center. Staff time and materials are the only charges.

The Madison mainframe stores all employment records such as sick leave. No evaluative data is maintained.

School IMC personnel are investigating microcomputers for circulation. This year, ESEA Title IV-B funds will enable the school

system to place an Atari 800 in each high school and middle school and a Commodore VIC 20 in each elementary school. Teachers and administrators will have access to a computer laboratory. The District Media Center will preview, acquire, and circulate computer software. Its centralized repair services will service the microcomputers.

In addition to instructional uses, school IMC personnel are investigating other uses for the computers when the machines are not being used by students, such as circulation.

WISCONSIN

FUNCTIONS	Computers°			Terminals			TECHNOLOGIES										Comments
	MA	MI	MC	OCLC	Data	Other	Telephone	Teleconf.	Teletype	Word Processors w/micro-computers	Videotext	Microforms	Satellites	Cable TV	Repro-graphics	Security Systems	
General Use	# (equipment inventory, book catalog)							*		# *		*(card catalog on microfiche)		* # (used for preview of materials)			
Tech Acq	* #									# (book review list)							
Svcs Cat	* #			*								# (MARCfiche)					
Scheduling	*(films) # (central		* (films) media center			media)											Data also used to generate catalog
Circulation Checkout			[#]														
Statistics																	
Overdues																	
Interlibrary Loan	* [#] (16mm) # (equipment repair services)						#					* (audiovisual holdings)				*	
Information Retrieval	[*] (statewide data base)				* # (ERIC)												
Security																*	
Budgeting	* #																
Staffing	*									*							

°MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed
[ ] In the planning stage

TOTAL NUMBER OF STATES UTILIZING THE TECHNOLOGY (n = 9)

FUNCTIONS	TECHNOLOGIES																		
	Computers*			Terminals			Telephone	Teleconf.	Teletype	Word Processors	w/micro-computers	Videotext	Microforms	Satellites	Cable TV	Reprographics	Security Systems	Comments
	MA	MI	MC	OCLC	Data	Other												
General Use	4 [1]	1	5	2	[1]			2	1	6	4	[1]	2		5 [1]	3		
Tech Acq	3		1							2			1					
Svcs Cat	3		1	5						1			2					
Scheduling	4	[1]	3 [1]			1				1								
Circulation Checkout	[1]		2 [1]	[1]						1								
Statistics	1		3							1								
Overdues	1		5 [1]							1								
Interlibrary Loan	4 [1]			2	1		6		1	1			1					
Information Retrieval	2 [1]		1 [1]		8	1							3 [1]		1			
Security																	8	
Budgeting	5		2															
Staffing	3 [1]		1															

*MA = Mainframe
MI = Minicomputer
MC = Microcomputer

*In use in the state
#In use in the local school, district, or region surveyed
[ ] In the planning stage

APPENDIX B

Appendix B

PARTICIPANTS IN THE STUDY

For the local or regional districts:

Dick Chase
Library Media Specialist
Red Wing High School
Red Wing, Minnesota 55066

Eliza Dresang
Media Director
Madison City School District
Madison, Wisconsin 53703

Seena Kautz
Instructional Materials Center
Duneland School Corporation
Chesterton, Indiana 46304

Jane Klasing
Cooper City Schools
900 Stirling Road
Cooper City, Florida 33328

Pat Mautino, Media Director
Oswego County BOCES
P.O. Box 488
Mexico, N.Y. 13114

Janice Smith
District Media Center
North Glen School District
North Glen, Colorado

Tom Walker, Director
Media Services
Howard County Schools
Columbia, Maryland 21044

Jerry Wicks
Director of Media Services
Glenbrook North High School
Northbrook, Illinois

Dr. Daniel Wright
Director of Media
Auburn University
Auburn, Alabama 36830

For the state departments of education:

Alabama
Dr. Eloise Kirk
ESEA, Title IV
406 State Office Building
Montgomery, Alabama 36130

Colorado
Anne Marie Falsone, State Librarian
State Department of Education
1362 Lincoln Street
Denver, Colorado 80203
(represented by William Cound)

Florida
Sandra Ulm, Consultant
School Library/Media Services
Department of Education
Tallahassee, Florida 32304

Illinois
Marie Sivak, Educational Consultant
Illinois Office of Education
100 N. First Street
Springfield, Illinois 62777

Indiana
Phyllis Land, Director
Division of Instructional Media
State D.P.I., Room 229, State House
Indianapolis, Indiana 46204

Maryland:
Paula Montgomery, Branch Chief
School Library Media Services Branch, State DPI
200 West Baltimore
Baltimore, Maryland 21201

Minnesota:
Dr. Robert H. Miller, Supervisor
Educational Media Unit, State Dept. of Ed.
Capitol Square Building
St. Paul, Minnesota 55101

New York:
Beatrice Griggs, Administrator
Bureau of Libraries
Room 676, State Education Department
Albany, New York 12234

Wisconsin:
Richard Sorenson, Supervisor
Instructional Media Programs
State Department of Public Instruction
Madison, Wisconsin 53702

APPENDIX C

SCHOOL DISTRICT NO. 12, ADAMS COUNTY
INTERLIBRARY INFORMATION RETRIEVAL SERVICES

Interlibrary usage is essential to the vitality of libraries of all types and sizes as means of greatly expanding the range of materials to users. The purpose of this heirarchial chart is to show steps teachers and library media specialists may take to increase access to resources.

	Information Retrieval By	Type of Material Available	Procedures for Accessing Materials	Cost	Time Consideration
I. Interlibrary Loan Services A. Within District 12 Via DMC Master File Locator	Author	Print Materials including periodicals Audiovisual Materials	Complete ILL Form and submit to DMC Cataloger In-district location determined through master-file Request forwarded to school holding needed material Lender has the right to establish appropriate loan or deny loan request	None	7-14 days
B. Within Colorado	Colorado Union Catalog on Microfiche indexing 2.5 million records Telefax: a telephone electronic mail system	Print Materials Audiovisual Materials (Limited)	Colorado Union Catalog may be accessed at District Media Center to obtain materials from Colorado public, academic, school and special libraries Interlibrary Loan Services requested at closest Adams County Branch through Telefax services	Shipping costs; only replacement at current value of lost or damaged items	7-21 days

	Information Retrieval By	Type of Material Available	Procedures for Accessing Materials	Cost	Time Consideration
C. Within Nation OCLC Terminal	Author Title ISBN No. LC No.	Print materials (majority) Audiovisual materials (limited)	Complete ILL Form and submit to DMC Cataloger OCLC data base searched for national location when unavailable in-state Cataloger selects closest of state locations and electronically processes request Requested item received, routed and returned to DMC for ILL Loan handling	$1.35 per item plus shipping; also replacement at current value of lost or damaged items	10-14 days
II, Walk-in Services A. Feeder School Use of Resources Within District #12	Card Catalog, reference materials, indexes etc.	Upon agreement: Print mat. Ref. mat. Audio-visual mat. Facilities Equipment	Inquiring teacher request and arrange for use of feeder-school resources and facilities by contacting principal and library media specialist Teacher clearly defines expected outcome in terms of student learning Host principal and library media specialist establish user priorities of facilities, materials and staff	None; only replacement cost at current value of lost or damaged items	Upon agreement by host school principal and library media specialist
B. Within Adams County Public Library System	Same as above	Print mat. Ref. mat. Audio-visual mat. Facilities Equipment	Individual check-out of materials requires each student have a valid Adams County Library card enabling them to check out materials from any Adams County Branch Class use must be coordinated by the teacher for scheduling facilities, tours or personnel	None; only replacement cost at current value of lost or damaged items	Immediate to 14 days

	Information Retrieval By	Type of Material Available	Procedures for Accessing Materials	Cost	Time Consideration
Adams County (cont)			Class assignments requiring use of public library resources should be communicated well in advance by teacher to public library staff		
C. Within Metropolitan Area Public Library System	Card catalog, ref. materials, indexes, periodicals, etc.	Print Mat. Ref. Mat. Audiovisual Mat. Facilities Equipment	Adams County Library card enables patron to borrow from all metropolitan public library systems except Denver Public Library	None; only replacement costs at current value of lost or damaged items	7-14 days
D. Academic Library Use of Resources	Card catalog, ref. mat., advanced indexes, tech. journals, etc.	Print Mat. Advanced ref. mat. Audiovisual mat. Facilities	High school teacher provides academic library a list of names and social security numbers of students who need to use resources and facilities Academic library issues student a "Use Card" Circulation service coordinated through H.S. library M.C. for overdue materials and student follow-up Entire class may be oriented as a group upon prior arrangement Instruction in research process is high school teacher's responsibility	Replacement of lost or damaged item at current value	Immediate to 21 days
III. Computerized Search	In-depth subject searches (majority) Occasionally by title, author	Citations Abstracts Hard-copy reprint Selected copies of journal articles Microfiche	Service requested through: any public library academic libraries independent information research specialist contacted through DMC	$15.00-$65.00 and up depending upon complexity of search Cost of microfiche Cost of print copy	7-14 days