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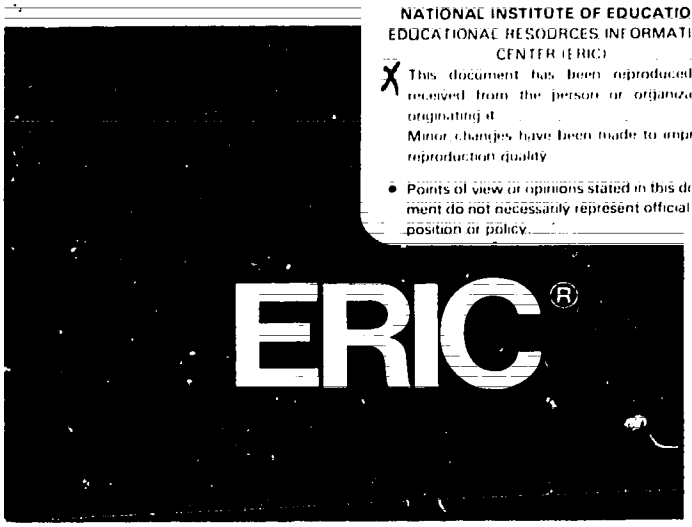
ABSTRACT

This annotated bibliography lists 12 items in the ERIC system that concern various applications of microcomputers in educational management. The literature here annotated examines the development of management information systems, papers on administrative computing presented at the 1982 Association for Educational Data Systems conference, educational budgeting and computer technology, steps to follow in choosing administrative software or a student information management system, hidden costs of office computerization, and the development of a simple, unified information base by using a database management system. Other annotated documents examine microcomputers in planning and monitoring custodial work, controlling inventory, computerized purchasing, the importance of school managers' awareness of the "human factor" when introducing new technology to school staff members, microcomputer applications in educational program planning development, and the development of a computerized record-keeping system to reduce paperwork created by efforts to comply with certain government regulations. (PB)



Number 71, October 1983

The Best of ERIC presents annotations of ERIC literature on important topics in educational management.

The selections are intended to give educators easy access to the most significant and useful information available from ERIC. Because of space limitations, the items listed should be viewed as representative, rather than exhaustive, of literature meeting those criteria.

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Management Uses of Microcomputers

1 **Alabama Center for Evaluation.** *The Administrative Use of Microcomputers: Technical Report.* Alabama University, College of Education: August 1982. 15 pages. ED 221 946.

Managing a school requires the manipulation of a massive—and ever-growing—amount of information. Most large and midsized school systems already depend on mainframes or minicomputers to manage payroll, personnel files, student test scores, attendance records, and so forth. But, in the near future, according to this knowledgeable report, microcomputers will help lift the burden of information management at the building level as well.

Typically, administrators interested in developing a computerized management information system (MIS) have proceeded by trial and error. Over the years, "small fragmented networks of computer-using administrators have begun to learn what hardware . . . and software configurations, utilization patterns, and physical arrangements may be optimally combined for administrative purposes." This report—by providing advice on prioritizing needs, costing the system, personnel resistance, selecting software, staff training, and evaluation—can help ease this "systems analysis" task for the busy administrator.

The direct costs of a computer system are relatively easy to calculate. But administrators should also be aware of the "hidden" costs of a computerized MIS. For example, preliminary research "suggests that training costs in terms of staff hours may at least equal the direct costs of the system itself." "Creep costs"—a "perverse form of operating cost that administrators are familiar with in other contexts"—should also be taken into account.

Administrators should also anticipate the resistance of office workers to the new technology. Implementation should be gradual, and office workers should be given formal "hands-on" training.

2 **Association for Educational Data Systems.** *AEDS Proceedings: The Tomorrow in New Technology; Frontiers in Administrative Computing; Adventures in Instructional Computing.* AEDS: Washington, D.C., 1982. 513 pages. ED 223 239.

Computer literacy training for administrators should focus on data-base management and word processing, not on computer programming. Large, decentralized school districts are finding that distributed data networks ideally meet their needs for information management. A microcomputer with a hard-disc storage device can easily handle all the "student accounting" tasks of a large high school.

These are just a few of the ideas on administrative computing presented at the 1982 AEDS conference. Of the 122 papers in this collection, 15 directly address the administrative uses of microcomputers. The balance discuss such topics as computer-assisted instruction, computer-managed instruction, computer literacy for staff and students, and the uses of microcomputers for the teaching of the handicapped.

In general, the papers addressing the administrative uses of microcomputers are concerned with the practical "how to's" of implementing management information systems (MIS's) for school administration. Most authors agree that microcomputers can greatly ease the crushing burden of paperwork that now takes so much administrative time. New, integrated MIS programs—with data-base management and distributed data network capabilities—offer the promise of simpler yet more powerful and efficient approaches to school administration in the very near future.

3 **Bliss, Sam W.** "Educational Budgeting and Computer Technology." *School Business Affairs*, 49, 5 (May 1983), pp. 54-55, 69. EJ number not yet assigned.

"The vast majority of districts are not using the full potential of computers to prepare educational budgets and to control operational expenditures." This admittedly "harsh" statement by Bliss is supported by a look at the historical development of computer use in school administration. Excellent software has been developed to perform budgeting and expenditure accounting; but very little software is in use today for "program budget development." Bliss here proposes a design for this type of software, which would "collect, process and provide school district administrators with management information" to support the budget development process.

Program budgets are usually developed by four managerial groups: principals and department heads at the school level; supervisors, directors, and assistant and associate superintendents; the superintendent and deputy superintendent; and the school board. The kinds of information contributed and needed by each of these groups for budget development are quite different. But appropriate software can maximize the contribution at each level to a well-planned and sensible budget.

An operational budget-development program of the type Bliss describes can provide numerous advantages. Budgets can be redone very quickly and easily. Simulations of the effects of particular budgets can be performed. And the budget can be easily modified at any level "to obtain the most desired educational program and resource allocation." Bliss includes a list of districts that have successfully implemented computer-based budget planning systems.

4 **Crawford, Chase W.** "Questions to Ask Before Buying Administrative Software." *School Business Affairs*, 49, 5 (May 1983), pp. 48, 68. EJ number not yet assigned.

The three basic steps to follow in choosing a microcomputer for a school or district are as follows: First, decide on the functions that should be automated and their levels of priority. Second, find the microcomputer program (software) that performs these functions best. Third and last, purchase the actual microcomputer hardware that runs the selected software.

When deciding which functions to automate, Crawford advises, "consider all potential administrative uses for a microcomputer." But when implementing a system, "computerize only those functions which can be more efficiently and effectively performed by a computer." Such functions are usually characterized by massive amounts of data, the need for repetitive processing, and a need for processing speed.

When software is being selected, choose "general applications software"—such as data management, electronic spread sheets, and word processing programs—before selecting "specific applications software," such as budgeting, energy management, and purchasing programs. Many of these programs have been recently developed, Crawford warns, so some still contain "bugs."

Other aspects of a program that should be carefully examined before purchasing are its documentation, the type and quality of its input and output, and the reputation and reliability of the company that produced it. For example, is the documentation clearly written, well organized, and indexed? Does the company update the documentation and software periodically for little additional cost?

For input, does the program prompt the user with well-defined and easily understood input fields? Does it recover gracefully when erroneous data—such as letters instead of digits—are entered? Can the same input be used for several different programs so it doesn't have to be reentered? Crawford concludes with numerous other questions of this type to help administrators choose software wisely.

5 **Delf, Robert M.** "How to Shop for a Student Information System." *American School and University*, 54, 12 (August 1982), pp. 18, 20. EJ 269 911.

Student records can be maintained using an inhouse computer, a time-shared computer, a commercial service bureau, or traditional manual methods. Delf here discusses these four approaches to student information management (SIM) and outlines the advantages and disadvantages of each approach.

Having an inhouse microcomputer for SIM is currently in vogue. Unfortunately, though, says Delf, currently available programs are very limited because "they do not integrate all applications but rather address only one or two. In an integrated system, all applications share the same student data base and no data is duplicated." If promising SIM software is found, Delf suggests that administrators evaluate it carefully before buying, especially the support for the system provided by the manufacturer.

Time-sharing a central computer is a viable alternative to an inhouse computer if the central computer has a comprehensive SIM system. Commercial time-share vendors usually do not have good SIM systems, says Delf. But if a district or county system "can make such a system work, it will probably be the most economical."

Commercial service bureaus used to be the only option available for computer scheduling and grade reporting. Today some of these bureaus specialize in SIM systems. Administrators considering these bureaus should evaluate their service as they would software—in terms of cost, comprehensiveness, documentation, flexibility, turnaround time, and on-line capabilities.

6 **Hoover, Todd, and Gould, Sandra.** "Computerizing the School Office: The Hidden Cost." *NASSP Bulletin*, 66, 455 (September 1982), pp. 87-91. EJ 268 234.

Microcomputers have the potential to make school administration much more streamlined and efficient. But to make the best use of this new technology, administrators must deal effectively with the practical aspects of purchasing hardware and software, maintaining the computer system, and training themselves and staff members in its use. Hoover and Gould here present some valuable pointers for these tasks, as well as a knowledgeable discussion of the "hidden costs" of office computerization.

Before purchasing any hardware or software, administrators should analyze the needs of their office and then decide which of these needs computers can efficiently fulfill. Currently, microcomputers are being used effectively for the scheduling of classes and bus routes, word processing for correspondence and reports, and student information management. To help pin down these needs, Hoover and Gould suggest talking to other administrators who are using microcomputers or hiring a computer consultant to do a needs analysis.

Hardware and software should be purchased from a dealer who has a good reputation, an onsite repair capability, and a convenient location. The dealer should also have a variety of products that can be demonstrated and compared. "Insist on a demonstration of the equipment and the program(s) you intend to purchase," the authors advise.

The hidden costs of computerizing the school office often exceed the apparent costs. These hidden costs include the time investment of the administrator in learning the new system; the costs of consultants for needs assessment and initial setup, maintenance costs, special furniture to accommodate the new equipment, insurance, and the cost of training staff members to use the computer.

7 **Jones, Kenneth, and Dukes, Thomas.** "Microcomputers in School Administrative Management." *Educational Technology*, 23, 3 (March 1983) pp. 38-39. EJ number not yet assigned.

Most computer programs for school administration on the market today are designed to perform one primary function, such as reporting attendance, scheduling classes, or recording grades. Schools using more than one of these programs usually must record the same data on a number of different tapes or discs and must load separate programs and data for each function. In addition, many types of data manipulation—for example, correlating student attendance and grades—simply cannot be performed with such programs.

With the use of a modern "data-base management" (DBM) system, though, say Jones and Dukes, a simple, unified information base can be utilized for a variety of record-keeping functions. Redundant data can be sharply reduced with such systems, office efficiency can be greatly increased, and school administrators can quickly compare one set of data with any other.

Such integrated DBM systems, Jones and Dukes point out, are already used on many larger computers. Advances in technology, combined with rapidly declining prices, have made this technology readily accessible to schools with microcomputers, though there is presently a dearth of commercially available DBM software aimed specifically at the educational market.

The authors compare a DBM system to a wheel with a hub and spokes. The hub is the unified base of data. The spokes—each accessing the hub—are the "special programs" for scheduling classes, monitoring attendance, grading, registration, and maintaining

information on disciplinary actions, student medical records, and so forth. To go from one spoke to another, the user simply types a command on the microcomputer's keyboard and, if the information is privileged, an appropriate password. Using a very simple "query language" that is a part of most DBM systems, administrators can also make inquiries that are not included in the basic programs.

8 **Kantlehner, Jerry.** "Computerizing Custodial Services." *School Business Affairs*, 49, 2 (February 1983), pp. 38, 48. EJ 276 391.

Computers are increasingly being used for a variety of administrative and instructional tasks. So why, asks Kantlehner, is "the second largest budgeted department"—custodial services—"still living in the Dark Ages?" Money can be saved and efficiency gained if the school's micro- or minicomputer is used to plan and monitor custodial work and control inventory.

Before running out to buy a program for custodial service management, administrators should ask themselves about the current state of custodial services in their school. Is inventory data timely and accurate? Do detailed usage and reorder data exist? Have material and labor costs been established in each area involved?

If the answers to these questions are "no," says the author, administrators should go back to the drawing board, because "no computer will work without first developing a good manual procedure. Computers are no more than fast clerks. If you put 'junk' data in your system, you will get 'junk' data out."

Several types of reports should be generated by a good custodial management program. An "ending, on hand inventory record" should show amounts on hand, usage per day, reorder amounts, and costs of items used. Another report, the "cost data per item record," should show the costs of monitoring different areas. Costs should be displayed according to three separate factors: per square foot, per working day, and per school per student. Other reports should itemize inventory items on order and summarize inventory status.

9 **Mazurek, John M.** "Computerized Purchasing." Paper presented at the Association of School Business Officials annual meeting, October 1980, New Orleans. 9 pages. ED 196 150.

What used to be the labor of calculators, copying machines, editors, and secretaries, says Mazurek, "is now the ease of CPU's, Word Processors and high speed laser printers." Computerization and office automation are becoming common in government offices, small businesses, and even homes. "It is no wonder then," says Mazurek, "that in this day of maximization of efficiency and minimization of cost, the watchdog of utilization, the purchasing department, would be in quest of simplifying methods and procedures to produce maximum output."

In this paper, Mazurek briefly describes the metamorphosis of modern school purchasing from a slow, labor-based operation to an efficient, computer-driven process. His ideas—though discussed in terms of larger, district-level purchasing departments—are equally applicable to equivalent tasks performed at the school level.

Typing and issuing purchase orders can take significant amounts of time. Just typing out 50 to 100 orders can take 1 to 2 full-time clerk typists a full day. But a computer can perform the same job in just a few minutes.

A computerized system can also provide timely, detailed printouts on the status of purchase orders. This kind of information can give the purchasing manager a great deal of control over the complex purchasing process and thus keep headaches to a minimum. Finally, computers can be valuable tools for the inventory and control of a school or district's fixed assets.

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10 **Mitchell, Robert E.** "Tomorrow's School Office Today." *American School and University*, 54, 8 (April 1982), pp. 30, 35. EJ 261 593.

The "school office of the future"—in which most clerical tasks are performed using sophisticated electronics and microform systems—is approaching rapidly. To smooth this wrenching transition into the near future, says Mitchell, school policy makers and managers should understand both the "human factor" involved in the school office metamorphosis and the "definition of function" of tomorrow's office.

"The definition of function—with respect to efficiency, economy and intelligent purpose—has now come to involve a highly automated office environment where most clerical chores are performed electronically and where productivity of managerial and professional personnel is dramatically improved." But, Mitchell advises, this new definition should not be implemented without careful consideration of the human element, for it is this human element that will determine whether the office of the future succeeds or fails.

In particular, school managers should consider whether the new technology will be accepted or rejected by the school's staff. Most current staff members "have reached their current levels of responsibility by using communications equipment that they and others" understand and that worked well for them for years. Too much new technology in too short a time, though, can breed fear, resistance, and even rejection of the new ways.

To combat such reaction, Mitchell suggests a gradual implementation of the office of the future. Start immediately, he advises, but start small; proceed gradually; provide comprehensive and continuous training, and "allow people to adjust to the new system at their own pace without being forced."

11 **Morgan, James M.** "Microcomputer Applications in Educational Program Planning Development." Paper presented at the American Educational Research Association annual meeting, New York, March 1982. 15 pages. ED 224 455.

In the business world, computers are routinely used for such fiscal management tasks as inventory control and accounting and also for more advanced tasks such as planning and forecasting, resource allocation, and project monitoring. In school administration, computers are commonly used for basic clerical tasks, but have not yet received wide use as planning, development, and evaluation tools. Morgan here describes how one school system – the Cincinnati Public Schools—is beginning to utilize the higher capabilities of its Apple II microcomputer.

Using a database of information on the district's individual schools, a "School Profile Program" allows users to compare schools or groups of schools on each of a number of variables. Using such information, "it can be determined whether schools with the specified characteristic differ significantly from the district-wide averages."

Another program allows trend analysis and forecasting to be performed. Currently, forecasts can be made on only one variable at a time, but a multiple-variable extrapolation program is under development. Another program under development will be used to simulate the effects of specific program intervention on a school variable.

The district is also developing a program to produce PERT charts and schedules of project activities. "Output from the program will include a PERT network showing the interrelationship of project events, and a listing of project activities with beginning and completion dates and persons responsible for each activity." Finally, the district is developing an advanced program for statistical analysis specifically geared to the needs of educators.

12 **Newman, Daniel G.** *Develop and Implement a Computerized System to Collate, Analyze and Maintain Records on All Student Discipline Infractions and Administrative/Teacher Punitive Actions in the Seaford Senior High School.* Ed.D. Dissertation, Part I, Nova University, September 1978. 96 pages: ED 193 765.

Since 1975, the Office of Civil Rights has requested local school systems receiving federal financial assistance to maintain detailed records and statistics on all student discipline procedures and actions. Districts complying with this regulation have found it to be a tremendous burden in terms of the amount of manual paperwork needed. Newman—the assistant principal of a Delaware senior high school—here explains how he developed an efficient computerized system for maintaining and organizing this information.

The rationale used by Newman for the development of this system was as follows: "As administrators, we and our staff had to spend many long, tedious hours on the purely clerical and monotonous functions of record keeping. Our invaluable time was better spent making educational decisions at a level commensurate with our professional abilities."

Newman started by searching for available programs from other districts or government agencies that would fill his needs. Finding none, he worked out a program with the director of a local technical school's computer center. He also redesigned the input forms for disciplinary data and helped train office workers and faculty to use the new system.

Newman recommends that this system not be viewed as an end product, but as a model for creating other record-keeping systems for student scheduling, attendance reporting, grade reporting, personnel records, budgeting, and payroll.

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