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ABSTRACT

Microcomputers can vastly improve the efficiency of data management, data analysis, and communications in the school office, but implementation should be carefully planned, with attention to relative cost for benefits obtained, appropriateness of software and hardware, and potential security risks. (TE)

ERIC Clearinghouse on Educational Management

ERIC DIGEST

MICROCOMPUTERS IN THE SCHOOL OFFICE

Microcomputers can vastly improve the efficiency of data management, data analysis, and communications in the school office. Implementation, however, should be carefully planned in advance, with attention to relative cost for benefits obtained, appropriateness of software and hardware to tasks required, and potential security risks.

What administrative functions can microcomputers perform?

As John Lindelow has observed, "asking what computers are good for in educational management is akin to asking what administrators do with their time." That is, microcomputers have the potential to help you, the school administrator, carry out virtually all of your primary duties of managing personnel, money, programs, and physical resources. Indeed, anything that involves gathering, assessing, manipulating, updating, or disseminating information can be made easier with a microcomputer. Hence, computerizing operations is likely to be worth the investment when (1) massive amounts of data are to be processed, (2) processing is highly repetitive, and/or (3) speed of processing is of great importance.

The administrative uses of microcomputers fall into four broad categories: data management, data analysis, word-processing, and communications. A brief sample of the school records that can be stored and manipulated by microcomputers includes student records, personnel records, inventories of school equipment, financial records, and special management records (such as transportation, food service, energy management, and sports program management).

Besides storing large quantities of information for easy access, microcomputers can also be a potent tool in analyzing data. The electronic spreadsheet, for example, shows instantly the overall ramifications of any alteration in a school budget or other quantifiable data, such as enrollment projections, time schedules, or test averages. Other available software permits the user to translate raw data into bar graphs, pie graphs, and tables, or to perform complex calculations in a fraction of the time otherwise required.

Word processing is easily the most far-reaching innovation in written communication since the typewriter or the printing press. Currently available word processing programs enable administrators to compose, address, revise, correct, combine, rearrange, or delete written copy before it ever reaches paper, and then to print multiple letter-perfect copies in a wide variety of formats--preaddressed and personalized, if necessary. Versatile graphics programs offer the same flexibility with anything that can be drawn in black and white or in color.

Communications--the linkage of microcomputers with one another or with a mainframe computer--include such applications as electronic mail (replacing the burden of interoffice correspondence) and access to bibliographic databases (ERIC is an example) and information utilities such as The Source. Through the use of a modem, administrators can thus transform their micros into terminals for sending or receiving information, via telephone lines, to and from another computer anywhere in the district--or indeed, in the world. An advanced form of communications is the local area network (described below).

What steps should I take to computerize my school office?

Because of the rapid progress in microcomputer technology, a well-conceived plan in designing and implementing a computer system is essential. There are three basic steps: (1) decide what functions should be automated and in what order of priority, (2) identify software that best automates these functions, and (3) identify hardware that runs the selected software.

In developing a priority list of tasks to be computerized, you should conduct a cost-benefit analysis for each function considered, making sure in each case that a computer-based solution is most cost-effective. Carefully outline user requirements for each task, with input from all potential users. Develop a timeline based on priorities, and assign specific responsibilities to staff members for implementation.

Lindelow suggests that word processing is a good place to start in computerizing school operations, since word processing programs are normally easy to use and therefore quickly dispel "computer phobia." From there, the next step is to explore electronic spreadsheets and other quantitative analysis programs, before making final decisions about a data management system.

How do I select software and hardware?

In reviewing software, the most important prerequisite is to be well informed of the range of options for each task. Software of general applicability is likely, at first, to be more cost-effective, flexible, and available than software designed specifically for functions of educational administration. Consider such factors as availability of support from supplier (including user training and followup advice, refundability, and a discount on multiple copies), a balance between flexibility and ease of use, and compatibility with other software. With regard to the latter, the IBM-compatible MS-DOS microcomputer operating system has recently emerged as the

industry standard for administrative use in both the public and private sector.

The current trend in computerized administration is toward "integrated management" systems, which combine database management progams, spreadsheets, word processing, graphics, and communication in a single versatile program. One step in this direction is "database management systems" (DBMS), which combine record keeping and data analysis in one system.

Determination of hardware should then be based on the selected software. The minimum microcomputer configuration for administrative purposes should include a standard typewriter keyboard, an 80-character wide screen with a diagonal measure of at least 12 inches, a 132-column wide dot matrix or character-impact printer, a 64K memory, and two floppy disk drives. In considering the cost of the overall system, include maintenance, software, and training along with initial purchase cost.

What should I know about local area networks?

A local area network (LAN) interconnects computers and their peripherals by wires and cables so that information can be transmitted at high speeds over limited distances--between offices, classrooms, or buildings. Unlike the modem, which allows two computers to communicate via telephone lines, local area networks can tie together a large number of users simultaneously.

Local area networks have been commercially available for only a short time. Current systems, according to Philip Piele, have four major limitations: (1) the need for network management, (2) the shortage of technical support from retail stores and network vendors, (3) the lack of multi-user database management system software, and (4) the lack of network versions of popular applications software.

Of these, the latter three are likely to improve with time, but network management will be a major challenge to the educational administrator. As Piele has observed, "Someone has to take responsibility for such things as installing and debugging the network, writing special programs so single-user applications software will operate efficiently on the network, writing a network users' guide, and managing printer access and output....Such a person must have a combination of problem-solving skills, systems-programming expertise, and management training or experience."

In short, you will need to train or hire a network manager--possibly as a full-time position--if you choose to install a local area network. At present, the best recourse is to wait, or to install a small low-cost prototype network in order to gain hands-on experience with the emerging LAN technology.

What about security?

Computerization poses a range of new concerns for the security of school records, especially when a local area network gives many users access to the database. For this reason, a key criterion in evaluating data management software is how much and what kind of security it provides. Ideally, programs should provide for accessibility to different parts of the database by people with different levels of security authorization through a system of passwords, locking codes, and so forth. But ironically, the more integrated a data management system becomes (that is, the more accessible by related software or by multiple users), the greater the security risks become as well.

Programs have yet to be written for local area networks that will allow access of school records to many different users (i.e. teachers, counselors, and administrators) and at the same time restrict access by some users to certain fields within a database. Database security remains one of the major challenges of the computer age.

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