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The use and implementation of microcomputers in secondary administration

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Abstract

The growth of computers since 1975 has been remarkable. Throughout. the country, computer stores are opening their doors to a public that is realizing the many uses of computers in homes, businesses, and schools. Computer technology has been available for many years, but it has only been since the availabilty of relatively inexpensive microcomputers that elementary and secondary schools could afford the educational advancement. National and state commissions on education recommended that computers become a part of the school curriculum. Boards of education have purchased computers to place in schools. Private industry has joined the computer movement in schools by providing free or reduced prices for hardware and software.

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The growth of computers since 1975 has been remarkable. Throughout the country, computer stores are opening their doors to a public that is realizing the many uses of computers in homes, businesses, and schools.

Computer technology has been available for many years, but it has only been since the availability of relatively inexpensive microcomputers that elementary and secondary schools could afford the educational advancement. National and state commissions on education recommended that computers become a part of the school curriculum. Boards of education have purchased computers to place in schools. Private industry has joined the computer movement in schools by providing free or reduced prices for hardware and software.

Gustafson (1985) feels that the result has been a perception that the increased use of computers in schools is nothing more than a frenzied reaction to public pressure with little thought given to the appropriateness of computers. Quickly written curriculum guides for computers are the evidence of this pressure.

Gustafson (1985) also states that it is fortunate that level-headed people are coming to the forefront with thoughtful, reasonable research of what should be the capabilities and uses of computers in schools. Because of these people, computers and the ideas associated with computers are now being accepted for such purposes.

Radin (1983) indicates that companies and organizations in the private sector that have utilized computers in management showed considerable growth in profits and employee earnings as well as in

levels of employment. To date, the emphasis has been on classroom usage of computers. With the successes achieved by the private sector, there is no reason why computers cannot be used to help administer the secondary school.

Before blindly diving into using computers as an administrative assistant, Stallard (1983) and Gustafson (1985) state that the feasability of computer use must be carefully studied. There is little known about the impact of computers in an administrative setting. Stories of great computer successes are often offset by disastrous stories of computer systems purchased which did not meet the needs of the school system. These authors continue by stating that before administrative application of computers can be implemented, a great deal of thought and planning must be done in the form of a needs assessment. Parker (1985) and Gustafson (1985) emphasize that a thorough review of the research completed is important to determine what is already known about current technology. Many references are available on the use of computers in administration. A review of the literature will help sell the concept to the decision makers and will also show that the necessary research has been done.

In determining the needs assessment, Crawford (1985) states that it must be determined what administrative tasks should be computerized. There are many functions involved in administering a secondary school, one which involves recordkeeping and accounting procedures. Gustafson (1985) suggests other tasks which could be considered for computer applications, such as purchasing, budgeting, inventories,

scheduling, and attendance records. All are part of information needed to be an effective school administrator. Parker (1985) feels that a cost/benefit analysis must be conducted for each task that is under consideration for computerization. Parker (1985) continues by stating that the key question is always, "In what way can the computer do something better than we are currently doing it?" If the task cannot be done more efficiently on the computer, then the procedure should remain the same.

These decisions are not easy ones to make until the administrator understands what computers can do. Crawford (1985) states that an administrator can save time, money, and avoid future problems by becoming computer literate before determining what tasks should be computerized.

He suggests four situations that would generally justify the use of a computer, provided that the task to be performed is of high priority. They are: (1) massive amounts of data are processed through well-defined operations, (2) when the processing is highly repetitive, (3) when the speed of processing is important, and (4) when the tasks to be performed are not practical by manual means.

Huntington (1984) believes that one of the most important uses of a computer in administration is in the area of communications. Typing consumes more secretarial time than any other clerical activity. Letters, forms, and documents of various types, comprise an endless stream of typing chores. Joiner (1982) states that many of the letters that administrators write are routine correspondence requiring only

changes in name and address and perhaps a few key words, yet in many school offices, these letters are typed from scratch every time they are used. Documents or reports are also typed and then revised for total retyping. He concludes that a large part of this typing time may be saved using a word processing system.

Word processing is truly one of the most important labor-saving uses of the computer. Crawford (1985) defines word processing as the writing of new text or the recalling of a previously written text from memory, editing it, and producing it in a final form on paper. Correcting one typing mistake using a typewriter could mean the retyping of an entire page. The user of a word processor can easily correct spelling, change words, remove or add phrases or sentences, underline references, or move entire paragraphs before the document is printed in final form. Because instantaneous changes are possible, a great deal of time can be saved. Gustafson (1985) estimates that anywhere from 50 to 80 percent of the time currently spent writing formal documents could be saved through word processing.

The everyday chores can be easily done using a word processor. Daily bulletins or announcements can be edited which allows new information to be added and dated information deleted at a touch of a computer key.

Radin (1983) states that spelling software programs are available for word processing software. These spelling programs can detect spelling and typographical errors in documents that are prepared with

dictionaries containing up to 50,000 words. Questionable spellings are marked to be reviewed by the writer. Special technical words can be added to the dictionary to expand the usefulness of the program.

School administrators have a need for a large amount of factual information about students and faculty. Data based management systems offer a way to make this never ending chore easier. Crawford (1985) defines a data base as the computer equivalent of a filing cabinet full of information an administrator may want to retrieve. A good data base system will give an administrator the ability to generate reports without having to understand more technical elements of programming. The results of the information needed can be printed in the format most useful to the administrator.

Storing student information is the most common use of a data base system. Gustafson (1985) gives suggestions as to the type of information that can be stored on a data base. They are the student's name, address, phone number, parents' name, birthdate, homeroom assignment, and grade in school. The amount of information stored can vary depending on what information the school deems to be important. Students' class schedules along with classes already taken can be included.

Gustafson (1985) also believes that the true strength of a data base system is the accessibility of each record to school personnel. A counselor may consult the records to determine which graduation requirements have been met. A secretary can develop a mailing list from the records. If the program includes absences and tardies,

problems can be identified early and corrective measures can be taken. Lemon (1985) states that it is important to select a data base system that can be integrated with a word processing system. Form letters developed with a word processor can use address information from a data base to simplify the process of sending letters to a large group of people.

A good data base system can standardize the information that many school personnel need and use. Having basic student data readily available for different purposes makes information retrieval easier. Huntington (1984) concludes that the ability to access accurate and current data helps administrators make more effective decisions. He suggests that the second most important piece of software that an administrator can have is a data base system.

Gustafson (1985) states that computers deal with numbers and handle them very efficiently. All of the letters, words, symbols, and commands used to operate a computer are ultimately translated into numbers within the central processing unit.

Gustafson (1985) continues by stating that most of the early applications of computers were to speed statistical computation and this remains among the major uses of the machine today. Most problems that can be solved with a calculator, a pencil, and a sheet of paper could be solved with what is called an electronic spreadsheet.

Crawford (1985) defines a spreadsheet as much like an accountant's working papers, with labels, values, and columns in which information and numbers may be arranged to assist in organizing numerical data.

A typical spreadsheet would have 64 columns and 254 rows with which to work. Within these parameters, many formats and calculations or manipulation of figures can be accomplished.

Many books and articles have been written to help solve business problems. Gustafson (1985), Joiner (1982), and Crawford (1985) all agree that businesses have used spreadsheets to help keep track of inventories, estimate expenses and income, and budgeting. A school administrator can use a spreadsheet for the same activities. Other suggested school activities that could be handled by a spreadsheet are book counts, enrollment records, salary schedules, substitute pay records, and test standardizations.

One problem facing all school administrators is keeping track of the building's general fund. This is essential if the school is to be run effectively. Using a spreadsheet program can greatly assist the administrator with this task. The spreadsheet is an excellent tool for budgeting. Crawford (1985) states that all transactions dealing with the general account can be entered on the spreadsheet and balances are automatically calculated for disbursements and receipts. If an administrator wants to see what would happen to the entire budget when changes are made to any item, the spreadsheet can generate an entire new budget in seconds incorporating the changes. If these same calculations were done manually, hours of time could be invested to obtain the same results.

Gustafson (1985) recognizes the many nonfinancial uses of a spreadsheet. Building inventories can be developed, attendance

summaries can be generated, even grades can be entered into a spreadsheet and calculate needed grade point averages for honor rolls and permanent records.

In a school, there are management tasks that can be accomplished using a computer. Joiner (1982), Gustafson (1985), and Jacobson (1984) all state that attendance is important to schools not only because it is desirable to have children attend school as required by law, but in many states, funding is based on attendance. The key to improved attendance is a follow-up as early as possible during the day to determine the reason for the absence. Students who are chronically late may be identified early and targeted for counseling. Jacobson (1984) concluded that in many cases, academic failure of a student is directly related to the number of absences. Most parents are concerned with the whereabouts of their children and welcome a more efficient way of recording attendance.

Pogrow (1985) discusses a new device called a robot caller. This device is used to help monitor attendance. Robot callers are computerized programs that can automatically dial the homes of students who are absent. These devices can be automatically programmed to keep calling the numbers of specified students (such as students absent that day) every fifteen minutes until the phone is answered, whereupon a recorded message is played and the response is recorded. Pogrow (1985) claims that this mechanism is credited by many schools with improving attendance as much as 10 to 15 percent.

Crawford (1985), Gustafson (1985), and Joiner (1982) agree that developing various schedules is another time consuming activity that preoccupies administrators. Scheduling students, coordinating teaching schedules, class size, room availability, and pupil needs are very difficult and time consuming for the administrator. Joiner (1982) states that large computers have been successful in managing these tasks, but high costs have prevented many schools from using them. Many scheduling packages available for microcomputers provide an effective solution to many school districts today.

Gustafson (1985) states that scheduling systems usually contain two major files which must be combined, the master course list and the students' class choices. The master course list takes into account all the courses the teachers teach, their preparation periods, supervision periods, and lunch periods. All student choices are entered into the computer and the computer generates a schedule for the administrator on which to base a final decision.

Gustafson (1985) continues by stating that in addition to scheduling students into classes, the computer can be used to schedule rooms for classes, develop master class schedules, produce class lists for teachers, create individual student schedules, and identify any remaining conflicts. Gustafson (1985) concludes that the computer cannot solve all scheduling problems, but 99% of the scheduling can be completed by a computer.

The computer can be used by a building administrator to develop the school calendar, athletic events, field trips, assemblies, and

social events. All of these events are subject to rescheduling because of circumstances beyond the control of the administrator. However, with the use of the microcomputer, it is convenient to have immediate access to this information and make any necessary changes (Gustafson, 1985).

When administrators consider computerizing some of their office tasks, some major problems may exist. Bloom (1985) states that the fear of the problems which a computer might cause, or computerphobia, results from the lack of facts about the computer's capabilities. Today, industries rush to get on the computer bandwagon, and put intense pressure on some individuals to learn about computers. Stallard (1982) feels that these pressures sometimes result in anxiety and resistance to the technology. The same feeling exists in education. Bruce (1985) states that schools tend to relegate computers to math and science classes. This fits the belief that technical skills are essential for the use of computers and that computers are best for teaching technical subjects.

Bloom (1985) and Crawford (1985) both state that computer anxieties commonly lead to avoidance of the machines or to problems in learning about the machines. These fears and anxieties about computers will have to be resolved. Crawford (1985) insists that administrators must provide training for people who will be working with the computers in the administrative setting. Providing workers with the basic facts about computers and hands-on experience is the first step in relieving computer anxieties. Crawford (1985) continues

by stating that administrators must provide release time for these people to attend workshops and release time for skill building practice sessions.

Another problem that must be addressed by the administrator is people's tendency to resist change. Cutts (1982) believes that for a significant change, such as introducing computers into adminstrative settings, the school administrator has to be the leader.

When computers are installed in the school office, many adjustments will have to be made. Cirillo (1984) and Crawford (1985) both establish that to some people technology is threatening. The office staff and secretaries must relinquish old habits that contributed to their success under the school's previous system. They must learn new tasks, skills, abilities, and ways to come to grips with a new technological culture. Consequently, they may exhibit psychological resistance to the changes.

Strong leadership by the administrator is needed to alleviate these fears. Crawford (1985) stresses that successful management of change requires the involvement and active participation of all staff members who will be affected. The staff must be included in all decisions ranging from what tasks will be computerized to where the equipment will be located. They cannot feel that this decision was made by some higher being and it is their job to carry out this decision. The staff is more likely to make the change enthusiasticly if they have a feeling of "belonging" with the decision and that they had a part in the ultimate decision. Church (1985) puts it in a nutshell

by concluding that barriers to an effective computer technology program can be overcome if appropriate cooperation and training strategies are utilized.

Administrators must select the appropriate computer software and hardware based on decisions made during the needs assessment. Crawford (1985) and Gustafson (1985) both state that after the administrator knows how the computer will be used, the search for the appropriate software (the computer programs) can begin. After the appropriate software has been identified, only then can the search begin for the hardware (the actual machine and other peripheral equipment) needed to implement the system. Both authors caution administrators that approaching computers from a hardware position first is only inviting trouble.

Gustafson (1985) states that when choosing software for administrative purposes it is important to understand that efficiency is the most important aspect. Pretty colors and graphics are not important. It is important to remember that the software has to perform its function well.

The first consideration is if the software will perform the needed functions. For example, Gustafson (1985) notes that filing and spreadsheet programs should be able to add and delete data, sort and arrange data, and merge different types of files.

If the office is to become fully computerized, Lynn (1985) states that integrated software should be investigated. Integrated software has the ability to perform many tasks by the user with a single computer

disk. Brooks (1986) states that improved quality of software, ease of use, decreasing cost of equipment and software, and the fact that most management applications can be completed while using one or more software packages have led to the growing popularity of these applications software packages. Lynn (1985) states that the areas most commonly included in integrated software are word processing, data base, electronic spreadsheets, and graphics. An example of integrated software's capability, as given by Lemon (1985), allows the administrator while writing a report using word processing, to include information from the data base or spreadsheet, or both, and include that information in the word processing document. Lynn (1985) estimates the cost of an integrated program as $300, which becomes cost efficient when performing numerous administrative repetitive tasks (Each component purchased separately could cost between $200 and $400).

Gustafson (1985) emphasized that the school administrator and clerical staff should have the opportunity to try out any software that is under consideration for purchase. Administrative software will be used many times during the course of a day. Crawford (1985) and Gustafson (1985) stress that if the software does not do what is needed or is too difficult to learn, it should be rejected.

Finally, consideration must be given to the software vendor. Savitsky (1986) states that schools have traditionally enjoyed pre-ordering services provided by salespeople who offered demonstrations, previews, examination/demonstration copies, answers to questions, and

trade show exhibits. He continues by noting that post-ordering services have also been provided including demonstrations of getting the program to operate, and even in-service training. Schools have usually received assurances of a refund if the product did not perform satisfactorily. The reputation of the company should be investigated. Gustafson (1985) points out that the vendor should be able to provide names of people who currently use its programs so schools can check with previous purchasers about their level of satisfaction with the programs and the services of the vendor.

The needs assessment will give a school most of the information needed in making the decision concerning hardware. According to the Computer Technology and Reading Committee (1984) the school must first select hardware that is compatible with the software already chosen. If hardware is selected first, it could be difficult to find compatible software.

A major concern when deciding on hardware is the amount of memory in the computer. The minimum memory requirement for most administrative programs, according to Crawford (1985), is 64K. With some programs, in contrast, Gustafson (1985), suggests as much as 256K of memory. The purpose and sophistication of the software determine the memory requirement, and, to operate usefully, the computer must be able to support that need.

Expandability is an important factor to consider in puchasing hardware. Gustafson (1985) and Crawford (1985) both believe that for maximum performance, the computer must have the capability to

attach a variety of peripheral equipment. As new and better programs are introduced, more memory capacity could be a necessity. Computers that do not allow for future increases in memory capacity may not be worth purchasing.

A printer is an essential addition to a computer system. According to Lemon (1985), the printer gives the user a hard copy of whatever is on the screen or in memory. He identifies the two main types of printers as dot-matrix printers and letter quality printers. Lemon (1985) also believes that dot-matrix printers are usually inappropriate for most office applications, however new products appearing on the market may be attractive to school districts with limited budgets. Such a printer would be necessary for anything that requires graphs, illustrations, and special print types. For outgoing correspondence, Crawford (1985) states that a letter quality, daisy wheel printer should be used. Documents produced using daisy wheel printers resemble material produced by a typewriter.

The influences computers have had on society are impressive, but the influences computers could have on education are unlimited. The use of computers in business is a tremendous example of the capabilities of computers.

Administrators need to realize the great tool that they have at their disposal. Computers have the potential to bring all kinds of changes to school administration. Administrators who are interested in moving into the computer age must intelligently manage the transition.

The process of change must involve a proposal backed by a needs assessment and must include staff input.

The availability of effective computer systems means that administration is reaching a point where paperwork can be simplified, meaning that the administrator will have more time to become an educational leader.

REFERENCES

Books

Gustafson, T. J. (1985). Microcomputers and educational administration. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Joiner, M. L., Vensel, G., Ross, J. D., and Siverstein, B. (1982). Microcomputers in education. Holmes Beach, FL: Learning Publications, Inc.

Radin, S., Greenberg, H. M. (1983). Computer literacy for school administrators and supervisors. Lexington, MA: D. C. Heath and Company.

Stallard, J. J., Smith, E. R., Reese, D. (1983). The electronic office. Homewood, IL: Dow Jones-Irwin.

Periodicals

Bloom, A. J. (1985). An anxiety management approach to computerphobia. Training and Development Journal, 39, 90.

Brooks, L. (1986). Microcomputers applications and the electronic office. Business Education World, 66, 11.

Bruce, B., Michaels, S., Watson-Gegeo, K. (1985). How computers can change the writing process. Language Arts, 62, 143.

Church, G. D., Bender, M. (1985). School administration and technology: planning educational roles. Educational Technology, 66, 22.

Cirillo, D. J. (1984). Helping middle managers manage office technology. Personnel, 63, 8-9.

Computer Technology and Reading Committee. (1984). Guidelines for educators on using computers in the school. Journal of Reading, 28, 64.

Crawford, C. W. (1985). Administrative uses of microcomputer, part I: needs evaluation. NASSP Bulletin, 69, 70-72.

Crawford, C. W. (1985). Administrative uses of microcomputers, part II: specific tasks. NASSP Bulletin, 69, 53-60.

Crawford, C. W. (1985). Administrative uses of microcomputers, part IV: determination of hardware. NASSP Bulletin, 69, 115-118.

Cutts, D. E., Mathews, W. M., Winkle, L. W., Nichols, J. L. (1982). Administrator microliteracy: a challenge for the '80's. NASSP Bulletin, 66, 54.

Huntington, F. (1984). Microcomputer in the principal's office. Thrust, 14, 33.

Jacobson, T. (1984). Keeping track with computers; student attendance accounting. Thrust, 14, 33.

Lemon, D. K. (1985). A new computer! Becoming acquainted and making it work for you. NASSP Bulletin, 69, 10.

Lynn, L. E. (1985). Integrated software: a versatile management tool. The Principal, 64, 44.

Parker, J. (1985). A five-step process to help educators decide how to use computers in schools. NASSP Bulletin, 69, 5.

Pogrow, S. (1985). Administrative uses of computer: what is the ideal system? what are the trends? NASSP Bulletin, 69, 50.

Savitsky, D. (1986). Discounting's a bad bargain. Electronic Learning, 5, 21.