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COMPUTER COMPETENCIES FOR SCHOOL ADMINISTRATORS

DISSERTATION

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The problem with which this study is concerned is that of identifying, validating, and ranking a set of computer competencies for school administrators. A set of thirty-five proposed computer competencies for school administrators was prepared and submitted for validation to a panel composed of ten members. These ten panel members judged the competencies and suggested additional competencies that they felt should be added to the list of proposed competencies. These additional competencies were also validated by this panel. A final list of forty-two validated competencies was established and submitted to a panel composed of thirty-one members for the purpose of determining the importance the panel members attached to each competency.

The ten panel members were utilized to determine those computer competencies that were acceptable and those that were not acceptable for school administrators. If eight of these panel members agreed that a competency was not acceptable, then that competency was omitted from the study. Only one competency, being able to write administrative programs, was omitted from the study.

The thirty-one panel members were utilized to rate the importance they attached to each of the forty-two validated computer competencies on a five-point scale. Mean ratings

for each of the forty-two competencies were computed. The mean ratings for these competencies ranged from a low of 2.21 to a high of 4.34. The competencies were arbitrarily placed in one of six areas--literacy, programming, applications, software-hardware, resources, and educational computing--for the purpose of reporting the data findings.

This report concludes that the data findings seem to support the theory that instructional computing is of greater importance to school administrators than administrative computing. It also concludes that if computers are going to be used fruitfully by school administrators in the future, some of the emphasis being placed on instructional computing will need to be diverted from this area and directed toward administrative computing.

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CHAPTER I

INTRODUCTION

In elementary and secondary school systems there are many administrators who have little or no experience with computers and others who have limited experience using computers to perform administrative functions. Hussain (3, P. 2) believes that since computers have been helpful to administrators in business, they could therefore be used to upgrade educational administration. He also indicates that information systems technology may enable school administrators to achieve many objectives more effectively and efficiently than was formerly possible (3, p. 5). Such statements, as well as the increased availability of computers in the school systems, have caused school administrators to seek ways to use computers to assist in the administration of school systems.

Numerous studies have been undertaken and an even greater number of publications deal with the subject of computer literacy. Most of the effort has been directed toward the area of computer competencies for teachers and pre-college students. Initial research in this area appear to be related to the Association for Computing Machinery (ACM), which now has a special division dedicated to the use

of computers in elementary and secondary education, the Elementary and Secondary Schools Subcommittee (ESSS) (1).

Within the ESSS there are twenty-six task groups. The task group on teacher education has established the computer literacy competencies that are needed by teachers; these competencies will be utilized in this study. A similar list of competencies for administrators, however, has not been developed by the subcommittee on Administration and School Boards. Luehrmann (4), a nationally recognized leader in computer literacy, suggests that computer literacy courses for elementary and secondary school administrators are, nevertheless, seriously needed.

A comprehensive study of computer literacy competencies for elementary and secondary school administrators therefore seems to be vital to those who are interested in conducting workshops and teaching college courses for administrators. The results of such a study may also be useful to colleges and universities that offer programs in elementary and secondary school administration.

Statement of the Problem

The problem with which this study is concerned is the computer competencies that are needed by elementary and secondary school administrators.

Purpose of the Study

The purpose of the study is to identify and rank a set of computer competencies needed by elementary and secondary school administrators.

Research Question

To carry out the purpose of this study, an answer is sought to the research question that asks what computer competencies are needed by elementary and secondary school administrators as viewed by those in the fields of educational administration and computing.

Significance of the Study

Many school systems have had access to large main frame computers for several years. A technological revolution in electronics has resulted in the placement in many schools of relatively inexpensive microcomputers that have many of the same capabilities of larger main frame computers. The interest of school administrators has increased in the use of these computers to help perform some school administrative functions.

Based on the indication of increased interest for using computers in elementary and secondary school administration, there should be a concomitant increase in demand for computer literacy courses for school administrators. A review of related literature (see Chapter II) reveals that work has begun in the area of computer literacy for school

administrators. The increased availability of hardware and software for administrative purposes, which is being marketed by educational computer vendors, is another factor indicating the significance of expanding research in the area of computer competencies for school administrators.

DiGiammarino (2) and Pogrow (5), who teach college courses for school administrators, agree that the demand for workshops and college courses in computer literacy for elementary and secondary school administrators will increase in the next few years. As evidenced by the lack of prior research designed to establish competencies for such workshops and college courses, the quality of these offerings may not be of the highest. In an attempt to insure future workshops and college courses are of high quality this study is significant in that it will result in the identification of the computer competencies that are needed by elementary and secondary school administrators.

Definition of Terms

School administrators are any non-teaching personnel who have the responsibility of supervising or administering academic and non-academic programs (i.e. superintendent, director, supervisor, principal, counselor, and assistants of each).

Computer literacy for school administrators is a general working knowledge of electronic computers and data processing in an education system at an effective level.

Computer competencies for school administrators includes the abilities to use computers and understand their applications in related educational administration tasks.

Limitations

This study is subject to the normal limitations of collecting data by mail. Another limitation is the varying levels of computer literacy within the population.

Procedures for Collecting and Analyzing the Data

The design of this study is based on its purpose to determine computer competencies for school administrators and to rank the competencies according to importance. Data used in the study were collected from (a) a validation panel composed of ten members, and (b) an evaluation panel composed of thirty-one members. Data collected from the validation panel were used to establish the competencies, while data collected from the evaluation panel was used to rank the competencies in order of importance.

Competencies

A tentative set of proposed competencies in (Appendix A) was prepared based on statements in the related literature (Chapter II) and those provided by professionals in the

fields of educational computing and elementary and secondary school administration. Teacher competencies that have been previously identified were also considered. These competencies were then submitted to a group of ten authorities in the fields of educational administration and computer science. These professionals judged the initial list of thirty-five competencies to determine which competencies are not appropriate and whether or not additional competencies in (Appendix B) needed to be added. Agreement was necessary from eight of the ten panel members in order to omit a competency. Additional competencies (Appendix B) became part of the list based upon the judgment of this group. Telephone interviews with each panel member were then used as the validation basis for these added competencies. Results of the validation panel members' responses are reported in Chapter IV.

Thirty-one evaluation panel members, who were directly involved in activities related to computer usage and administration, were selected from educational systems, college and university faculties, and educational computer vendors. These evaluation panel members rated each competency using a five-point scale of importance.

Panels

Ten authorities in the fields of educational administration and computing were chosen and are referred to as

validation panel members throughout this study. Each authority was selected on the basis of having made a nationally recognized contribution to the field of educational administrative computing in the form of publications or presentations. Also considered in the selection process is recognition by a state or national organization for having made a significant contribution to the use of computers in educational administration.

The evaluation panel is composed of thirty-one members selected from areas that include (a) educational administration, (b) college or university faculties (c) computer vendors. The thirty-one members were selected on the basis of their being computer literate in educational administration. Eighteen of the evaluation panel members are practitioners in a field of education that utilizes computers. Six panel members are faculty members in institutions of higher education--three of whom are from computer science departments and three from educational administration departments. Seven members represent leading computer vending companies; each company named its representative.

Members of the validation panel (other than computer vendor representatives) were selected upon the basis of established reputation and knowledge of computer applications in educational administration. These members were approved by the doctoral advisory committee.

Prior research on educational computing for elementary and secondary school administration appears to have been based on how the current computing technology can be applied to administration. Previous researchers in computer science and educational administration have identified applications that are appropriate for educational administration. Since this study attempts to place emphasis on allowing school administrators to contribute to the process of identifying the computer competencies that are needed by elementary and secondary school administrators, more members from educational administration are included in the population.

Reporting of Data

The validation panel members developed the final list of competencies, and the thirty-one evaluation panel members evaluated the competencies. For data evaluation, responses were necessary from all ten validation panel members and 80 percent of the evaluation panel members. The questionnaires for both the validation and evaluation panels are found in the appendices.

Data needed to respond to the research question are supplied by two instruments. The first instrument used in the study is the questionnaire completed by the validation panel (Appendix A). A second instrument was used to collect data on additional competencies that are suggested by the validation panel members (Appendix B). Data from these

instruments are used to establish the competencies that are rated by the evaluation panel. A third instrument solicits data from the evaluation panel that is used to rank the competencies according to importance (Appendix C). Mean ratings were determined and are reported in Chapter IV, and the priority of each competency was therefore determined by the mean rating.

Organization of the Study

This study is designed to address the issue of the computer competencies that are needed for school administrators. Identifying and ranking a set of computer competencies for school administrators is the focus of this study.

Chapter I includes the limitations and significance of the study along with definitions of specialized terms. The procedures for collecting and analyzing the data include an identification of the population and the data reporting methods.

Chapter II of this study is a review of the related literature. Chapter III is a description of the procedures used for collecting data. Chapter IV is a discussion of the analysis of the data collected. Chapter V includes the summary, findings, conclusions, implications and recommendations of the study.

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CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter provides an overview of the literature related to the areas of computer competency for school administrators. A synthesis of this literature is presented that deals with hardware, software, publications and presentations related to administrative computing. Prior research on needed computer competencies for teachers is also included as many of those are closely related to competencies for school administrators. Finally, a summary is presented of computer competency areas identified by this literature review.

Literacy

Literacy is one area of computer competencies for school administrators. The review of literature on literacy for school administrators focuses on the awareness, or knowledge of, computer topics and concepts that are related to the use of computers in schools. A competency may be placed in the literacy area if it concerns (a) functions or operations of computer components, (b) terminology, (c) history, (d) impact issues, or (e) values and benefits. Limited research has been conducted concerning literacy competencies for administrators.

The history of educational computing began with the use of large main frame computers for administrative computing. According to Osborne (23) prior to the 1960s computing capabilities were extremely limited due mainly to cost of computers. Smaller and less expensive main frame and mini-computers were then developed in the 1960s, and by the early 1970s, numerous school systems had begun to use computers to perform various administrative tasks.

By 1980, advances in computer technology had resulted in a new and less expensive microcomputer that could be used for educational computing purposes. Poirot (26, p. iii) points out that the relatively inexpensive microcomputer is providing school districts with administrative computing capabilities that were previously available only on the larger and more expensive systems. Mims (20) indicates that school administrators are now making the same decisions about the microcomputer that were made in the past about the larger systems. With the expanded main memory and increased capacities of external storage devices, most of the programs that run on the larger systems can be modified to run on microcomputer systems.

Along with this increased availability of computing in education came the increase in the need for school administrators to be knowledgeable about uses of computers in education. With the computer technology becoming available to the field of educational administration, Poirot (26,

p. 31) says that educators and computer professionals are beginning to find innovative ways to use computers, and they view the computer as having great potential. As this potential is explored the result is customized software for educational systems.

Although computers may aid the school administrator in solving many problems associated with administration of a school or school system, there may be some problems that the computer creates for the administrator. Simmons (30, p. 14) says that the three problems associated with computerized information systems are (a) the archaic condition of computerized student information systems, (b) the resultant slowdown of decision-making processes and (c) poorly served users-clients who are reliant upon such information systems.

Educational uses of computers that pertain to administrative applications may be classified into two categories. There are systems that perform some administrative function and those that provide only information needed by administrators to perform some administrative task. Such information is critically needed in order to utilize computers in administration.

Johnston (13) addressing the feasibility of educational computing, points out that computer systems have become economically feasible for use in school systems and the additional software which is needed to provide data and information for school administrators is becoming more

readily available from commercial vendors. Poirot (26, pp. 31-32) notes that research begun by professionals from many fields has led to improved tools being developed to aid school administrators in the decision-making process.

Administrators are becoming more aware of these uses of computers in education through publications in the field. During the late 1960s and early 1970s, perceptive professionals in education and computer science became concerned with the increased uses of computers in education and the lack of administrators who are knowledgeable about computers and published their concerns.

A report edited by Knezevich (14, pp. 58-59), states that school superintendents need to know how to use computer information. "The job of separating the useful information from the useless, and deciding what to do with it, is not a simple one for the superintendent" (14, p. 59).

Knowledge of computer terminology is also considered a part of literacy. School administrators also will need to be competent in the use of computer terminology. Salisbury (28, p. 33) deals with the computer terminology used by educators as he attempts to establish a consensus on computer terminology used by educators.

Another area of concern is the employment of computer personnel. Cloward (3, pp. 45-47) points out that some school administrators, who are faced with the task of hiring data processing directors for their school systems, may not

be competent to choose computer center personnel for employment.

Moursund (21, pp. 16-18), who is chairman of the ACM'S Elementary and Secondary Schools Subcommittee, recognizes the need for literacy materials for elementary and secondary school administrators, and wrote a report in 1980 entitled School Administrator's Introduction to Instructional Use of Computers (21). Moursund addresses the instructional areas more than the administrative areas of educational computing. Moursund defines computer literacy as

A knowledge of the capabilities, limitations, applications, and possible effects of computers. Two levels of computer literacy are often discussed. The lower level is an awareness knowledge. The higher level is a functional or working knowledge (21, p. 45).

Another example of a publication which addresses literacy for school administrators is Electronic Learning, a new periodical devoted to the use of computers in education. A section of each publication is entitled the "Administrator's Notebook." Pogrow (24, 25) who wrote two of these articles, also recognizes the needs of elementary and secondary school administrators in the area of computer literacy.

Computer literacy for school administrators should also include a perspective on the uses of computers in the educational setting. Shaw (29, p. 39), discussing the problems created by the use of computers in education, indicates the need for some type of computer literacy study for educational administrators to help establish an overall view.

Shaw states that "The problems of computer use appear to become more frequent and complex. What seems to be needed is a perspective" (29, p. 39).

Programming

Computer programming is another area of computer competencies for school administrators. The related literature identifies several competencies that deal with programming. A competency can be labeled as a programming competency if (a) programs are written, or (b) a knowledge of programming is required. The literature indicates that the level of programming ability required of school administrators is debatable. The need for programming as a computer competency for school administrators is addressed in the research instrument used in this study.

Luehrmann (18) indicates that the two very different ways to use computers in education are (a) to deliver instruction and (b) as an essential component of the subject matter. When the computer is an essential component of the subject matter being presented, programming of the computer is required. A portion of a computer workshop for school administrators conducted by Luehrmann is directed at teaching how to program a microcomputer, and he believes that although administrators do not have to be expert programmers, they should be able to write simple programs.

Some knowledge of programs that can aid in the administration of schools appears appropriate for school administrators. Pogrow (25, p. 20) evaluates computer programs that can be used to help the school administrator to perform certain administrative tasks. According to Pogrow, there are certain programming concepts that the administrator needs to know in order to evaluate administrative and instructional software. For instance, for an administrator to be effective in evaluating some software, the administrator should be aware that various computers use different operating systems and that not all programs will run on all computers; an administrator also needs some knowledge of the types and amounts of data that are required in the program being evaluated.

Applications

Educational administration applications that either involve or could involve the use of computers represents another area of computer competencies for school administrators. The literature indicates that school administrators will need to have a sufficient knowledge about computers to be able to identify the functions related to school administration that can be computerized. In addition to being able to identify applications for the use of the computer, they may need to participate in the actual design, planning, and implementation of a computerized system for administration.

Goodlad, O'Toole, & Tyler (13, pp. 59-85) gave an accounting in 1966 of the educational applications of computers. The listed administrative applications include general business accounting, student accounting, general administration, and administration of instructional programs. Examples of software being used for administration are also presented.

Regarding computer uses in education Johnston (13, p. 17) deals with both the instructional and administrative areas, and he states that "the major use of computers today (1971) is as a tool in administration" (13, p. 17). Johnston predicts that the data bases to come in the area of administrative data processing in schools are curriculum, personnel, facilities, students, and finance. Watson (36, pp. 18-23) briefly addresses some administrative applications for computers in 1971 that include recording administrative data on students, generation of staff payroll, and scheduling of teachers and classes more effectively.

As computer usage increased in the 1970s and the early 1980s so did the administrative computer applications. Poirot (26, p. 31), addressing computer applications for educational administration in 1980, also points out that the typical administrative processing models include the areas of personnel, financing, facilities, and equipment, and that a majority of these were developed by modifying existing business models. Roeks (27, p. 16) lists eight uses of computers in school administration that include accounting,

payroll, employee records, attendance, grades, student records, timetabling, and planning systems.

Administrators are involved in using information systems and in some instances participate in the development of information systems. Van Dusseldorp (34, p. 38) discusses the role and responsibility of management for information systems, and he deals with several topics that are related to administration and the use of computer information systems. He believes that the essential ingredients in the development, implementation, and operation of a successful computerized educational information system are (a) four different approaches to developing a computerized information system, and (b) five reasons that management should be involved in the implementation of a computerized information system.

Concerning administrators and their role in the development of an information system, Hussian says,

For the administrator to effectively discharge his role in the development of an information system, he must have the following qualities: the ability to use basic tools of analysis, the knowledge of fundamentals of the structure of information systems and data organization; and finally, an understanding of the process of the development of information systems (12, p. 7)

He also develops and presents materials that can be used to teach school administrators about the design and implementation of a computer information systems.

Moursund (21, pp. 20-21) also discusses the administrative uses of computers in education that deal with the

general record-keeping functions of school administration. Two specific research areas are computerized administrative information retrieval systems and statistical analysis of educational data. It is appropriate that school administrators should be competent in the use of computers in education for research, specifically in regard to information retrieval and statistical analysis of data.

Another computing application in which school administrators are interested is the utilization of information systems via telecommunications. Technology has provided the means by which schools that are located some distance from a centralized computer can be linked to the computer via communication lines and a terminal. In referring to remote utilization of computers in the counseling office of a school, Poirot (26, p 34), discusses the advantages of having a remote terminal in the counselor's office. Administrators can have current information at their fingertips rather than information that may have become invalid. Certain time delays may be avoided by allowing administrators to make inquiries and updates at the school site rather than allowing changes to be made only at a central data processing site.

Administrative computing capabilities are increasing at the school level as well as at the school-system level. School administrators at both the school level and at higher

levels will need to be competent in using computer information systems.

Also included in the area of applications is the use of computers by school administrators to aid them in the decision-making process. Poirot states that "advancements in meeting the needs specific to the educational administrator are resulting in enhanced decision-making procedures which included planning, budgeting, accountability, and so on" (Poirot, 1980, p. 31). New computer systems are being developed to enable school administrators to use "computer assisted modes of information control, reporting, operations research, feasibility simulations, modeling, and generally more efficient decision making" (26, pp. 31-32).

Also according to Poirot (1980, p. 31), computers are being used fruitfully by school administrators to aid them in the decision-making process. Mathematical applications such as modeling, simulation, operations research, statistical analysis and others are being implemented on education systems computers to aid administrators in the decision-making process.

It appears that computer systems are destined to become an integral part of the decision-making process of most school systems. Therefore, it would benefit most school administrators to be competent in this area of educational computing.

To improve the efficiency of educational decision-making, operations research is suggested by Van Dusseldorp, Richardson, and Foley (35). They present mathematical formulas and theories that could be applied to help in solving some problems that are associated with the educational decision-making process.

Computer modeling and simulation are also aiding administrators in the decision-making process. Kraft and Padro (16, pp. 13-15) discuss an information management system that could serve as a model to provide a means of improving manpower planning operations for educational systems. Another area in which modeling and simulation can be applied is in salary negotiations of employees; Spuck and McIsaac (16, pp. 44-45) discuss a computerized system that can be used to provide instant help in salary negotiations. Holloway identifies three ways in which simulation promises to aid managers to fulfill the planning function:

- 1 Provide more accurate information about the predicted effects of current systemic forces;
- 2 Provide important "decision-making" information about the effect of alternative management strategies;
- 3 Provide opportunities to examine the consequences of unusual systemic forces or conditions over selected periods of time (11, p. 36).

Certainly school administrators spend numerous hours making decisions involving the placement of personnel. Effective utilization of the computer might simplify and reduce the time required in administrative personnel

planning. Niehaus (22) discusses computer support systems that can be used to aid administrators in resource planning.

According to Mims (20) the expanded capacities and capabilities of the microcomputer now allow for the adaptation and use of many of the software packages developed to aid the educational decision-making process. It appears that an even greater emphasis is being placed in the 1980s on using computers to aid in the decision-making process.

Ellis states that "if computers are to be used fruitfully in education then the educators must be active participants in this use" (7, p. 39). This statement seems to imply that administrators should participate in the design of the educational computer system they will be using. Administrators may also need to participate in the selection of the computer system that they will use. Dennis (6) discusses the uses of computers by administrators as well as the role of the administrator in choosing the best computer system to meet the needs of the school or school district.

Considering the variety of computers and computing facilities that are in some school systems, there should be a means where by information stored on these computers can be shared. Networking of main frame, mini, and micro-computers could provide a means of sharing information between such computers. Kniefel and Just (15, pp. 42-51) discuss the impact of microcomputers on educational computer

networks. They point out that microcomputers and main frame computers should complement rather than compete with each other. School administrators will need the competency to select the best method of networking computers in an educational system.

Clemson (2, p. 99) made an even stronger statement concerning the participation of the user in the design of a computer system, educational or otherwise. Clemson states that "asking computer specialists to design the organization's information system is at least as reasonable as expecting the machinest to design a space capsule" (2, p. 99).

Software and Hardware

Selection and utilization of computer software and hardware is another computer competency area for school administrators. Although administrators will need to know the various hardware components and the functions they perform, the related literature seems to indicate that school administrators will not need to be technologically knowledgeable about computers to the extent that they understand the technology required to design a computer and make it function. Prior studies (22, 23) indicate that several aspects of computer software which will concern school administrators are usage, evaluation, and identification of software and its components.

Chavis (1), DeMar(5), and Graham (10) representatives of NCR, IBM, and Burroughs, respectively, in telephone interviews in October, 1982, provided an insight into the educational computing activities and plans of their companies. These three computer companies have begun aggressively pursuing the educational computer market. Prior to the 1980s, the cost of hardware marketed by these vendors severely limited the amount of computer usage by smaller school systems. The four main educational administration software packages currently available from these vendors are financial, payroll, inventory, and student accounting. Statistical and data base management software for school systems research and information management is also available from these sources.

These representatives also agree that hardware manufactured by these three companies and used by school systems for performing administrative functions ranges from large main frame computers to minicomputers. Software needed to perform administrative computing may be supplied by the computer vendor, the school system data processing personnel, or by an outside source. In some school systems, administrators are involved in the selection and purchase of a main frame computer or a minicomputer. School administrators are often involved in the identification and purchase of software needed to perform the administrative computing for their school district (1, 5, 10).

During the telephone interviews Chavis (1), DeMar (5), and Graham (10) reported software for instructional computing is available for main frame computers, minicomputers, and microcomputers. The cost of main frame computer and minicomputer instructional systems is prohibitive for most school systems and an even greater number of individual schools. However, according to Mims (20) the availability of the less expensive microcomputer instructional systems has enticed many schools to purchase them. Some school administrators will be involved in the selection and purchase of computers to be used for instruction, they will need to be competent in this process.

Resources

Informational and funding resources for educational computing entails yet another computer competency area for school administrators. Informational resources are relevant publications or professional consultation with experts in the field of educational computing. Funding resources for instructional and administrative computing may be found in various forms, and innovative school administrators are discovering new resources daily.

Another area about which articles are being published is the cost of educational computing. Some costs associated with computing included purchase and maintenance of software and hardware, supplies, and salaries of computing personnel.

Osborne (23, p. 8) gives a set of guidelines which school systems could follow when purchasing a minicomputer. These guidelines deal with the hardware, software, and personnel needed for instructional and administrative computing.

Moursund, addressing the cost of educational computing for both administration and instruction, by giving figures on the percentages of budgets typical school systems allocate to computing. He says that,

The typical pre-college school system spends 1% to 2% of its budget for computing. Generally administrative use currently exceeds instructional use, and there is relatively little research use of computers in school systems. Very few school administrators in the United States currently spend as much as 1% of their budgets for instructional use of computers. However this type of usage is now growing quite rapidly (21, p. 19).

Grady (9, p. 40) believes that educational software costs will rise from about \$10.7 million in 1980-1981 to \$75 million by 1985. If these predictions are correct, school administrators will find themselves having to justify the purchase of \$60 million of educational software. In most school systems this will also entail the purchase of additional hardware. One needed area of computer competency for school administrators, therefore, is knowledgeability of cost of educational computing for both instruction and administration.

Coburn and others (4, pp. 142-147) address the topic of funding computer acquisitions for schools and the involvement of principals and other administrators in the process

of securing funds for computing in their school systems. Sources are presented for both external and internal funding for educational computing systems. Provided in their appendix is a list of resources relating to (a) bibliographies and indexes, (b) on-line sources, (c) resource centers, (d) research and development, (e) projects, (f) computer learning places (g) user groups and computer clubs (h) hardware, (i) software, (j) associations, (k) periodicals, (l) funding, and (m) continuing education.

The review of the related literature confirms that school administrators need to be competent in identifying appropriate resources related to educational computing. These resources are of two types informational and funding.

Educational Computing

Educational computing is established by the literature review as the sixth and last computer competency area for school administrators. Competencies in the area of educational computing deal with the various uses of computers in instructional programs and costs associated with the administration and delivery of these programs.

Also included in the area of educational computing is the need for administrators to be aware of ways in which computers improve the quality of administration and instruction in a school system, and Clemson (2, pp. 91-112) explains how this can be done. He suggests that computers

can be used effectively to analyze and evaluate the results of administrative and instructional programs which have been implemented by school systems.

Training of teachers in the educational uses of computers is a concern of most administrators. Milner mentions the "opportunities that are being missed because many teachers at all levels do not know how to use computers in the classroom and are not prepared to teach about their impact on our society" (19, p. 544). Milner also points out that many administrators are unaware of what computers can be used for in education. Finally, Milner states, "Teachers and administrators must recognize how essential in-service training is for effective use of computers in instruction" (19, p. 546).

Prior Computer Competency Studies

Two significant studies have been done on the establishment of computer competencies for teachers. These studies were done by the Association for Computing Machinery (ACM) task group on teacher education (32) and the Texas Educational Agency (TEA) (33). The results of these studies are used in this study. There seems to have been little or no prior research to determine a set of computer competencies for school administrators.

In December of 1978, the Elementary and Secondary Schools Subcommittee (ESSS) of the ACM Curriculum Committee

met in Washington, D.C. Participants in this meeting were assigned to working task groups. "Computing Competencies For Teachers", by Taylor, Poirot, and Powell (32, pp. 42-51), is an outgrowth of their assignment to a task group dealing with teacher training, and it is reported to be the first study specifically designed to determine the needed computer competencies of educators. Competencies to be achieved, rather than programs or courses to transmit the competencies, is the focus of the committee's efforts.

The task group identifies three sets of computing competencies needed by teachers. Basic universal computing competencies needed by all teachers is the first set addressed; a second set of competencies is identified for teachers of computing; a third set is established that addresses computer related, subject-specific competencies needed by teachers.

Identified by the task group are computing competencies needed by all teachers in order to teach effectively in a society permeated by computers. Two goals established by the task group, to which the competencies are related, are (a) to understand computing and (b) to use computing. Competencies identified by the task group could be divided into (a) programming, (b) software and hardware, (c) terminology, (d) educational computing, (e) resources, (f) history, and (g) societal issues. These competency areas could also be

used in a study of computing competencies needed by school administrators.

An unpublished paper by the Texas Educational Agency (TEA) (33) is possibly the most comprehensive study to date that attempts to identify computer competencies needed by educators. Competencies developed by the TEA are prepared with the intent that they can be used with in-service and pre-service programs, schools, service centers, colleges and universities and other agencies. These competencies are typical of practical and on-the-job responsibilities in schools. The eleven competency areas identified in the TEA study are (a) educational applications, (b) implementation, (c) attitudes, (d) software, (e) programming, (f) computer hardware, (g) computers in society, (h) general applications, (i) informational resources, (j) computer terminology, and (k) future trends.

Certain competencies identified by TEA were previously identified by the ESSS task group on teacher education. The competencies identified by the task group are used by TEA as a starting point for expansion and development of new competencies. Although the competencies identified focus on the instructional role rather than the administrative functions of schools, many of the competencies could be considered as a basis for a study of computer competencies for school administrators, and other competencies could be modified to apply to school administration as well as instruction.

Summary

Toward the end of the 1960s books, journal articles, and presentations began to appear in regard to the educational computing scene. Most of the published material deals with predicted uses of computers in education. Although from 1975 to 1979 there was a lull in publications on administrative computing, the advent of the microcomputer brought a surge in publications related to administrative computing in elementary and secondary schools.

Computer literacy for school administrators as defined for this study is based on a synthesis of related definitions of computer literacy in previous research. Most research indicates that a computer literate school administrator should have an effective level of working knowledge of electronic computers and data processing in an education system. Computer competencies for school administrators is defined for this study based upon the work done by the ACM ESSS task group on teacher education. The task group's description was modified for school administrators. It appears that a computer competency for a school administrator would entail the ability to use computers and understand their applications in related educational administration tasks.

Although the six competency areas identified for this study are not a finite universal set of computer competency areas for school administrators, they do represent a

sufficient basis for establishing a valid set of computer competencies that are needed by school administrators. Thirty-five competencies (Appendix A) were developed in this study. Literature reviewed in this study was considered in the development of these competencies.

After reviewing this literature it would appear that one would easily conclude that educational administrators are going to use computers. Therefore, it is logical to assume that these administrators should be knowledgeable about computers and their educational uses.

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CHAPTER III

PROCEDURES FOR DATA COLLECTION

Introduction

The design of this study is based on its purpose to identify computer competencies for school administrators and to rank the competencies according to importance. Data used in the study were collected from a validation panel (composed of ten members) and an evaluation panel (composed of thirty-five members). Data collected from the validation panel are used to establish a set of computer competencies for school administrators. Data collected from the evaluation panel are used to assign a priority rating scale to the competencies established by the validation panel.

Competencies

A tentative set of proposed competencies was prepared by the researcher based on statements found in the related literature (see Chapter II) and those provided by the respondent professionals in the fields of educational computing and elementary and secondary school administration. Previously identified teacher competencies were also considered. Sources for each competency are given in Appendix H.

Six computer competency areas for school administrators are identified for the purpose of this study. This

concept of identifying computer competencies by areas was previously used by the ACM ESSS task group on teacher education in 1980 (1) and in an unpublished study done by the Texas Educational Agency in 1982 (2). The six areas used in this study are literacy, programming, applications, software-hardware, resources, and educational computing. A majority of the competencies are identified by the ESSS task group and the TEA study. These previously identified competencies were modified in most instances to make them appropriate for school administration. Competencies dealing with data bases, word processing, decision-making, and computing costs are included on the basis of the review of related literature and from personal interviews with professionals in the field of educational computing.

These competencies were then submitted to a group of ten authorities in the fields of educational administration and computer science. These professionals judged the initial list of thirty-five proposed competencies to determine which competencies are appropriate and whether or not additional competencies should be added. It was required that eight panel members agree in order to omit a competency. If at least eight panel members assigned a rating of not acceptable to a competency, that competency was omitted from the study.

Additional competencies became part of the study based upon the judgment of this group. A list of additionally

proposed competencies is given in Appendix B. A telephone interview with each panel member was utilized to validate these additionally proposed competencies.

Panels

Two groups of panel members were utilized in this study a validation panel and an evaluation panel. A discussion of the selection of panel members and responses solicited from them follows.

Validation Panel

Ten authorities (Appendix F) in the fields of educational administration and computing were selected and are referred to as validation panel members throughout this study. These authorities were selected on the basis of having made nationally recognized contributions to the field of administrative computing in the form of publications or presentations. Also considered in the selection process was recognition by a state or national organization for a significant contribution to the use of computers in educational administration.

Ten validation panel members were selected to review the original list of proposed competencies (Appendix A). Due to the implications of the national significance of this study, the selection of the validation panel members was very critical to the study. The validation panel members were selected based on previous contributions in the area of

educational computing, and further consideration was given to their professional positions and geographic locations. The ten members selected have the following backgrounds: general superintendent, supervisor of instruction, data processing director, state department of education specialist for computing, school district computing coordinator, professor of educational administration, two professors of computer science, author of computer literacy materials for school administrators, and past president of the Association of Educational Data Systems (AEDS).

Each validation panel member was mailed a set of the tentatively proposed competencies (Appendix A) along with a cover letter (Appendix D). Proposed competencies were retained or rejected, and telephone interviews were used to validate the new competencies recommended by the panel.

Evaluation Panel

The evaluation panel (Appendix G) is composed of thirty-one members selected from three areas that include (a) educational administration, (b) college or university faculty members, and (c) computer vendors. They were selected on the basis of their being computer literate in educational administration. Eighteen of the evaluation panel members are practitioners in a field of education that utilizes computers; six panel members are faculty members in institutions of higher education, three of whom are from

each computer science and educational administration; seven members represent leading computer vending companies, each of which named its representative.

Each evaluation panel member was mailed a set of competencies (Appendix C), which had been established by the validation panel along with a cover letter (Appendix E). Each evaluation panel member rated each competency using a five-point scale of importance. A mean rating was obtained for each competency based on the ratings assigned by the evaluators.

Responses

The responses of the ten validation panel members were utilized to develop the initial list of competencies, and the thirty-one evaluation panel members evaluated the competencies. Returns from all ten validation panel members and from 80 per cent of the evaluation panel members were necessary. The questionnaires for both panels are found in the appendices.

Data needed to respond to the research question were supplied by three instruments. The first instrument used in the study is the questionnaire completed by the validation panel (Appendix A). A telephone survey was used to solicit responses from the validation panel to the additional suggested competencies (Appendix B). Each of the nine additional proposed competencies was read to each panel

member; each panel member responded to the level of acceptability they placed on that competency; the scale used is 1 = acceptable, 2 = not acceptable, and 3 = no opinion. Data collected during the telephone interview was recorded on a second instrument (Appendix B). Data from the first two instruments were used to establish the competencies that were rated by the evaluation panel. A third instrument (Appendix C) was used to solicit data from the evaluation panel which, in turn, were used to rate the competencies according to importance. Results of the survey are included in Chapter IV.

A group of ten highly qualified validation panel members was selected to participate in the study. A cover letter of explanation (Appendix D), a list of competencies to be validated (Appendix A), and a postcard (for return to request a copy of the study's results) were mailed to each of the chosen validation panel members. A follow-up telephone call was made to each panel member after all questionnaires were returned; additional data were collected on the recommended additional competencies during the telephone conversations. Each of the nine additional proposed competencies was read to each panel member, who responded by stating the scale number corresponding to their perceived level of acceptability for that competency; the scale used is 1 = acceptable, 2 = not acceptable, and 3 = no opinion.

A group of thirty-one professionals from the three areas of educational administration, college or university faculty, and educational computer vendors served as evaluation panel members. A cover letter of explanation (Appendix E), a list of competencies to be rated (Appendix C), and a postcard (for return to request a copy of the study's results) were mailed to each of the chosen evaluation panel member.

A simple method of tabulating the number of scaled responses (acceptable, not acceptable, and no opinion) was used in the treatment of data collected from the validation panel members. A mean rating was calculated for each competency rated by the evaluation panel members based on scaled values assigned each competency.

Data collected from the validation panel indicate the panel members' feeling about the validity of a competency. Panel members rated each competency as 1 = acceptable, 2 = not acceptable, or 3 = no opinion. Those competencies that received at least eight not-acceptable responses were omitted from the list of competencies submitted to the evaluation panel. A discussion of the omitted competencies is given in Chapter IV.

Data collected from the evaluation panel indicate the panel members' feelings about the importance of each competency. A five-point rating scale was used by each panel member to rate the importance of each competency. A mean

rating for each competency was calculated by summing the ratings assigned by the evaluation panel members to each competency and dividing the sum by the number of panel members who rated that competency.

In brief, competencies for school administrators were established and ranked in order of importance based on data collected from two panels used for this study. Competencies established as valid by the validation panel were submitted to the evaluation panel for rating. The average rating for each competency was computed and used to assign a value of importance for each. These averages are presented in Chapter IV.

Summary

The design of this study is based on its purpose to determine computer competencies for school administrators and to rank the competencies according to importance. Data used in the study were collected from a validation panel of ten members and an evaluation panel composed of thirty-one members.

Two research instruments were developed for this study to provide data needed to answer the research question proposed in the study. One instrument was used to determine the computer competencies needed by school administrators. Ten highly qualified professionals in the field of educational computing were selected to validate the proposed

competencies and to propose additional competencies which they also validated. The list of validated competencies was submitted to an evaluation panel of thirty-one members in the field of educational computing. The evaluation panel members rated each competency using a five-point scale of importance.

Data provided by the research instruments returned by the validation panel were tabulated to determine which proposed competencies are not acceptable and which additional competencies should be added to the research instrument. Data provided by the research instruments returned by the evaluation panel members are used in Chapter IV to compute the average-importance rating of each competency.

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CHAPTER IV

ANALYSES OF DATA

Introduction

The purpose of this chapter is to present, analyze, and discuss the findings of this study. Data are examined as they relate to the research question.

Procedures for Collection of Data: Validation Panel

A questionnaire (Appendix A) to elicit data regarding which computer competencies are appropriate for school administrators was mailed to each member of a validation panel in order to establish the content validity of the instrument. This panel is composed of ten authorities in the fields of computer science and educational administration. Ten usable questionnaires were returned and are included in the analysis of the data. Nine additional competencies (Appendix B) suggested by those surveyed were judged acceptable through the use of a telephone survey of all ten respondents; these additions are also included in the analysis of data.

Analysis of Data: Validation Panel

The data collected from the validation panel indicate the panel members' judgement of the validity of each competency and their suggestions of additional competencies.

Panel members were given three ratings for judging each competency--1 = acceptable, 2 = not acceptable, or 3 = no opinion. Those competencies that received at least eight not acceptable responses were omitted from the list of competencies established in this study.

Analysis of Responses of Validation Panel

The responses of the ten members of the validation panel are presented in Table I. Each of the thirty-five originally proposed competencies were judged by the members of the panel. The total number of ratings in each category is displayed.

TABLE I
VALIDATION PANEL MEMBERS' RESPONSES
TO ORIGINALLY PROPOSED COMPETENCIES

Competency	Frequency (N = 10)		
	Accep- table	Not Accep- table	No Opin- ion
1. Terminology	10	0	0
2. Historical	3	5	2
3. Legal, moral & human issues	10	0	0
4. Values	9	0	1
5. Functions of hardware components	8	2	0
6. Data processing stages	6	2	2
7. Write simple programs	7	3	0

TABLE I--Continued

Competency	Frequency (N = 10)		
	Accep- table	Not Accep- table	No Opin- ion
8. Write administrative programs	0	10	0*
9. Explanation of software requirements	3	6	1
10. Awareness of instructional software	7	2	1
11. Awareness of administrative software	8	2	0
12. Planning an application	7	3	0
13. Elements of a district plan	9	0	1
14. Designing a district plan	7	3	0
15. Describe instructional arrangements	7	0	3
16. Ways to integrate computer & non-computer materials	9	0	1
17. Assessing hardware	5	4	1**
18. Identifying tasks for computerization	9	1	0
19. Awareness of computer decision-making	10	0	0
20. Experience using programs	10	0	0
21. Evaluating software & hardware	6	2	2
22. Evaluating instructional software	6	4	0
23. Identifying components of a data base	5	4	1

TABLE I--Continued

Competency	Frequency (N = 10)		
	Accep- table	Not Accep- table	No Opin- ion
24. Using a data base management system	10	0	0
25. Adapting software for administration	8	1	1
26. Using statistical software	5	3	2
27. Identifying sources of support for instructional computing	5	2	3
28. Identifying sources of support for administrative computing	8	1	1
29. Identifying sources of related literature	8	1	1
30. Identifying funding sources	7	0	3
31. Identifying alternative uses	9	0	1
32. Differentiate between forms of CAI	8	2	0
33. Characterize instructional uses	9	0	1
34. Knowledge instructional characteristics	8	1	1
35. Justifying computing costs	10	0	0

* Deleted due to number of not acceptable ratings.

** Deleted in this form; proposed as two new competencies.

Write administrative programs, competency 8, was rated not acceptable by all ten panel members; therefore, it was deleted from the final list. Assessing hardware, competency

17, was deleted in its original form; it was suggested that this competency be modified into two competencies.

These 2 competencies and 7 others were suggested by the panel and confirmed through telephone interviews with each panel member. A total of 9 additional competencies were added to the original list; the ratings for each are shown in Table II.

TABLE II
VALIDATION PANEL MEMBERS' RESPONSES
TO SUGGESTED COMPETENCIES

Competency	Frequency (N = 10)		
	Accep- table	Not Accep- table	No Opin- ion
1. Knowledge of responsibilities of personnel	4	5	1
2. Knowledge of copyright laws	7	1	2
3. Future trends	9	0	1
4. Problems of ownership	9	1	0
5. Assessing instructional hardware	8	2	0
6. Assessing administrative hardware	7	3	0
7. Instructional training needs	10	0	0
8. Administrative training needs	9	1	0
9. Student training needs	6	3	1

All 9 added competences were judged to be acceptable for this study. These 9 and the 33 remaining original competencies constitute the final list of 42 competencies submitted to the 31 member evaluation panel.

Analysis of Responses of the Evaluation Panel

Thirty-one professionals, who represented areas in (a) educational administration, (b) college and university faculty, and (c) computer vendors were requested to participate in the study. A questionnaire (Appendix C), designed to elicit data regarding the importance of each competency established by the ten-member validation panel, was mailed to each of the 31 professionals. Twenty-nine usable questionnaires were returned and are included in the data analysis.

Data collected from the evaluation panel indicate the judgment of each member regarding the importance of each competency. A five-point rating scale was used by each panel member to rate the importance of each competency. A mean rating for each competency was calculated by summing the ratings assigned by each member to each competency and dividing the sum by the number of panel members who rated that competency.

The 42 competencies were arbitrarily divided into 6 broad categories for purposes of discussion. These major competency categories are (a) literacy, (b) programming,

(c) applications, (d) software-hardware, (e) resources, and (f) educational computing. An analysis follows of the panel members' responses to the competencies in each area.

Literacy

Nine competencies (1 through 9, see Appendix C) that are in the literacy area were rated by the 29 panel members as summarized in Table III. The competencies are listed in

TABLE III

EVALUATION PANEL MEMBERS' RESPONSES TO LITERACY COMPETENCIES ACCORDING TO MEAN RATINGS

Competency	Frequency (N = 29)					
	Level of Importance					Mean
	1*	2*	3*	4*	5*	
6. Values	0	1	4	9	15	4.31
7. Future trends	0	1	7	10	11	4.07
5. Legal, moral & human issues	0	3	4	13	9	3.97
4. Knowledge of copyright laws	0	3	8	9	9	3.83
1. Terminology	0	1	9	15	4	3.76
9. Problems of ownership	0	2	11	9	7	3.72
2. Knowledge of responsibilities of personnel	2	4	6	12	5	3.48
3. Historical	1	9	11	5	3	3.00
8. Functions of hardware components	1	9	12	6	1	2.90

*1 = no, 2 = low, 3 = medium, 4 = high, 5 = extreme.

rank order based on the mean ratings computed from the data. A majority of the mean ratings is between 3.00 and 4.00. Two of the literacy competencies have mean ratings above 4.00; only one literacy competency has a mean rating below 3.00. Competency 6, values, has the highest mean rating of 4.31, and competency 8, functions of hardware components, has the lowest mean rating of 2.90.

Programming

Five competencies (10 through 14, see Appendix C) that are in the programming area were rated by the 29 panel members as summarized in Table IV. The competencies are

TABLE IV
EVALUATION PANEL MEMBERS' RESPONSES TO PROGRAMMING
COMPETENCIES ACCORDING TO MEAN RATINGS

Competency	Frequency (N = 29)					
	Level of Importance					Mean
	1*	2*	3*	4*	5*	
14. Awareness of administrative software	1	3	10	10	5	3.52
10. Data processing stages	1	4	16	5	3	3.17
13. Awareness of instructional software	1	6	14	6	2	3.07
12. Explanation of software requirements	2	11	11	4	1	2.69
11. Write simple programs	7	12	8	1	1	2.21

*1 = no, 2 = low, 3 = medium, 4 = high, 5 = extreme.

listed in rank order based on the mean ratings computed from the data. Three of the programming competencies (10,13,14) have mean ratings above 3.00, while the other two (11,12) have mean ratings below 3.00. Competency number 14, awareness of administrative, software has the highest mean rating of 3.52, and competency 11, write simple programs, has the lowest mean rating of 2.21.

Applications

Nine competencies (15 through 23, see Appendix C) that are in the applications area were rated by the 29 panel members as summarized in Table V. The competencies are

TABLE V
EVALUATION PANEL MEMBERS' RESPONSES TO APPLICATIONS
COMPETENCIES ACCORDING TO MEAN RATINGS

Competency	Frequency (N = 29)					Mean
	Level of Importance					
	1*	2*	3*	4*	5*	
22. Identifying tasks for computerization	1	2	4	12	1	3.97
16. Elements of a district plan	1	3	3	13	9	3.90
23. Awareness of computer decision-making	1	1	6	14	7	3.86
19. Ways to integrate computer & non-computer materials	0	1	11	9	8	3.83
18. Describe instructional arrangements	0	3	8	10	8	3.79

Table V--Continued

Competency	Frequency (N = 29)					
	Level of Importance					Mean
	1*	2*	3*	4*	5*	
21. Assessing administrative hardware	2	3	9	10	5	3.45
17. Designing a district plan	5	4	5	9	6	3.24
20. Assessing instructional hardware	2	6	9	9	3	3.17
15. Planning an application	4	4	9	9	3	3.10

*1 = no, 2 = low, 3 = medium, 4 = high, 5 = extreme.

listed in rank order based on the mean ratings computed from the data. All 9 applications competencies have mean ratings between 3.00 and 4.00. Competency 22, identifying tasks for computerization, has the highest mean rating of 3.97, and competency 15, planning an application, has the lowest mean rating of 3.10.

Software-Hardware

Seven competencies (24 through 30, see Appendix C) that are in the software-hardware area were rated by the 29 panel members as summarized in Table VI. The competencies are listed in rank order based on the mean ratings computed from the data. Six of the 7 software-hardware competencies have mean ratings between 3.00 and 4.00; only 1 software-hardware competency has a mean rating below 3.00. Competency

TABLE VI
EVALUATION PANEL MEMBERS' RESPONSES TO SOFTWARE-HARDWARE
COMPETENCIES ACCORDING TO MEAN RATINGS

Competency	Frequency (N = 29)					Mean
	Level of Importance					
	1*	2*	3*	4*	5*	
25. Evaluating software & hardware	0	4	7	9	9	3.79
26. Evaluating instructional software	0	4	8	8	9	3.76
29. Adapting software for administration	1	4	6	1	8	3.69
28. Using a data base management system	1	7	6	7	8	3.48
24. Experience using programs	2	6	8	7	6	3.31
27. Identifying components of a data base	1	6	9	9	4	3.31
30. Using statistical software	6	6	7	9	1	2.76

*1 = no, 2 = low, 3 = medium, 4 = high, 5 = extreme.

25, evaluating software and hardware, has the highest mean rating of 3.79, and competency 30, using statistical software, has the lowest mean rating of 2.76.

Resources

Four competencies (31 through 34, see Appendix C) that are in the resources area were rated by the 29 panel members as summarized in Table VII. The competencies are listed in rank order based on the mean ratings computed from the data.

TABLE VII
EVALUATION PANEL MEMBERS' RESPONSES TO RESOURCES
COMPETENCIES ACCORDING TO MEAN RATINGS

Competency	Frequency (N = 29)					Mean
	Level of Importance					
	1*	2*	3*	4*	5*	
34. Identifying funding sources	0	1	4	13	11	4.17
31. Identifying sources of support for instructional computing	0	4	4	10	11	3.97
32. Identifying sources of support for administrative computing	1	2	7	9	10	3.86
33. Identifying sources of related literature	1	2	7	14	1	3.69

*1 = no, 2 = low, 3 = medium, 4 = high, 5 = extreme.

Three of the four resources competencies have mean ratings between 3.00 and 4.00; one resources competency has a mean rating above 4.00. Competency 34, identifying funding sources has the highest mean rating of 4.17 and competency 33, identifying sources of related literature, has the lowest mean rating of 3.69.

Educational Computing

Eight competencies (35 through 42, see Appendix C) that are in the educational computing were rated by the 29 panel members as summarized in Table VIII. The competencies are listed in rank order based on the mean ratings computed from

TABLE VIII
EVALUATION PANEL MEMBERS' RESPONSES TO
EDUCATIONAL COMPUTING COMPETENCIES
ACCORDING TO MEAN RATINGS

Competency		Frequency (N = 29)					Mean
		Level of Importance					
		1*	2*	3*	4*	5*	
39.	Justifying computing costs	1	0	3	9	16	4.34
40.	Instructional training needs	1	1	2	14	11	4.14
42.	Student training needs	0	3	3	12	11	4.07
35.	Identifying alternative uses	0	1	6	14	8	4.00
41.	Administrative training needs	1	1	3	16	8	4.00
37.	Characterize instructional uses	1	4	3	11	10	3.86
38.	Knowledge of instructional characteristics	1	3	5	12	8	3.79
36.	Differentiate between forms of CAI	0	4	14	7	4	3.30

*1 = no, 2 = low, 3 = medium, 4 = high, 5 = extreme.

the data. Five of the educational computing competencies has mean ratings above 4.00, and the other 3 have mean ratings between 3.00 and 4.00. Competency 39, justifying computing costs has the highest mean rating of 4.34, and competency 36, differentiate between forms of CAI, has the lowest mean rating of 3.38.

Summary of Responses From
Evaluation Panel

Data collected from the evaluation panel members indicate their judgment of the importance attached to each competency as indicated by the computed mean rating for each competency. Panel members' responses to all 42 competencies (Appendix C) are summarized in Table IX.

TABLE IX
MEAN RATINGS FOR COMPETENCIES ONE THROUGH
FORTY-TWO IN RANK ORDER

Competency	Area	N = 29 Mean
39. Justifying computing costs	E*	4.34
6. Values	L*	4.31
34. Identifying funding sources	R*	4.17
40. Instructional training needs	E	4.14
7. Future trends	L	4.07
42. Student training needs	E	4.07
41. Administrative training needs	E	4.00
35. Identifying alternative uses	E	4.00
5. Legal, moral and human issues	L	3.97
22. Identifying tasks for computerization	A*	3.97
31. Identifying sources of support for instructional computing	R	3.97
16. Elements of a district plan	A	3.90
32. Identifying sources of support for administrative computing	R	3.86

Table IX--Continued

Competency	Area	N = 29 Mean
37. Characterize instructional uses	E	3.86
23. Awareness of computer decision-making	A	3.86
19. Ways to integrate computer and non-computer materials	A	3.83
4. Knowledge of copyright laws	L	3.83
18. Describe instructional arrangements	A	3.79
38. Knowledge of instructional characteristics	E	3.79
25. Evaluating software and hardware	S*	3.79
1. Terminology	L	3.76
26. Evaluating instructional software	S	3.76
9. Problems of ownership	L	3.72
29. Adapting software for administration	S	3.69
33. Identifying sources of related literature	R	3.69
14. Awareness of administrative software	P*	3.52
2. Knowledge of responsibilities of personnel	L	3.48
28. Using a data base management system	S	3.48
21. Assessing administrative software	A	3.45
36. Differentiate between forms of CAI	E	3.38
24. Experience using programs	S	3.31
27. Identifying components of a data base	S	3.31
17. Designing a district plan	A	3.24
20. Assessing instructional hardware	A	3.17

Table IX--Continued

Competency	Area	N = 29 Mean
10. Data processing stages	P	3.17
15. Planning an application	A	3.10
13. Awareness of instructional software	P	3.07
3. Historical	L	3.00
8. Functions of hardware components	L	2.90
30. Using statistical software	S	2.76
12. Explanation of software requirements	P	2.69
11. Write simple programs	P	2.21

*A = applications, E = educational computing, L = literacy, P = programming, R = resources, S = software-hardware.

All forty-two competencies are ranked in order from the highest to the lowest based on their mean ratings. Eight competencies have mean ratings of 4.00 or higher; 30 competencies have mean ratings between 3.00 and 3.97; four competencies have mean ratings between 2.21 and 2.90. Of all the 42 selected competencies, competency 39, justifying computing costs, has the highest mean rating of 4.34, and competency 11, write simple programs, has the lowest mean rating of 2.21.

Examination of the 10 highest rated competencies based on mean ratings reveals that 4 of the 6 competency areas are represented. Five of these competencies are in the educational computing area, 3 are in the literacy area, and the

areas of resources and applications each has 1 competency in the 10 highest rated competencies.

Examination of the 10 lowest rated competencies based on mean ratings reveals that 4 of the 6 competency areas are represented. Four of these competencies are in the programming area, 3 are in the applications area, 2 are in the literacy area, and 1 is in the software-hardware area.

Discussion of Findings

Forty-two computer competencies for school administrators were established in this study. Thirty-eight of these competencies have mean ratings that indicate they were judged to be of at least medium importance. The thirty-eight competencies that have mean ratings of medium or higher importance appear to be appropriate for use in future research, but the four other competencies may need to be omitted from future studies or modified since they were judged to be of less than medium importance.

Included in the ten competencies that have the highest mean ratings, several competency areas are readily identifiable. Justifying and funding computer purchases, training needs, identifying tasks and uses for computers, social issues related to computing, and knowledge of future trends have mean ratings which indicate that they are important for school administrators. These competencies are more closely

associated with instructional purposes than administrative purposes.

Two identifiable areas represented in the ten competencies that have the lowest mean ratings are being able to write programs and participating in the planning, designing, and implementation of administrative applications. Being able to write administrative programs was deleted from the study by the validation panel members, and the evaluation panel members rated the competency of being able to write simple programs at below medium importance. This seems to be a clear indication that programming is not considered important for school administrators. Competencies that deal with planning, designing, and implementing administrative applications for computers have mean ratings that indicate that they are not important for school administrators.

The major finding of this study, which is based on the data collected, appears to indicate that more emphasis is being placed on awareness and knowledge type competencies rather than on competencies that are related to being able to plan and use the computer for administrative applications. If this trend continues, school administrators may not be able use computers fruitfully in the foreseeable future.

Summary

A summary of the findings of this study follows.

1. One original competency involving the writing of administrative programs was omitted from the study because it was unacceptable to the validation panel.

2. The general competency on assessing hardware was divided into two competencies. They are (a) assessing instructional hardware and (b) assessing administrative hardware, as proposed and validated by the validation panel.

3. Seven other additional competencies in two areas, literacy and educational, computing were proposed. They are (a) personnel, (b) copyright laws, (c) future trends (d) computer ownership, (e) instructional training needs (f) administrative training needs, and (g) student training needs.

4. Although 3 competencies were judged as acceptable by only a minority of the validation panel members, they were not deleted from the study; these three competencies are (a) knowledge of responsibilities of personnel, (b) historical, and (c) explanation of software.

5. A final list of 42 computer competencies for school administrators was established; however, only 38 of these had mean ratings high enough to be considered of medium importance.

6. Five educational computing competencies are included in the 10 highest rated competencies. They are

(a) justifying computing costs, (b) instructional training needs, (c) student training needs, (d) administrative training needs, and (e) identifying alternative uses.

7. Three literacy competencies are included in the 10 highest rated competencies. They are (a) values, (b) future trends, and (c) legal, moral and human issues.

8. Only one competency from the resources area is included in the 10 highest rated competencies. It is identifying funding sources.

9. Only one applications competency is included in the 10 highest rated competencies. It is indentifying tasks for computerization.

10. Four programming competencies are included in the 10 lowest rated competencies. They are (a) write simple programs, (b) explanation of software requirements, (c) awareness of instructional software, and (d) data processing stages.

11. Three applications competencies are included in the 10 lowest rated competencies. They are (a) planning an application, (b) assessing instructional hardware, and (c) designing a district plan.

12. Two literacy competencies are included in the 10 lowest rated competencies. They are (a) functions of hardware components and (b) historical.

13. Only one software-hardware competency is included in the 10 lowest rate competencies. It is using statistical software.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, IMPLICATIONS, AND RECOMENDATIONS

The design of this study is based on its purpose to determine computer competencies for school administrators and to rank the competencies according to importance. This chapter presents a summary of procedures used to collect and analyze the data, the findings and conclusions of the study, the implications of the study, and recommendations suggested by the results.

Summary

A tentative set of proposed competencies (Appendix A) was prepared based on statements found in the related literature and those from interviews with professionals in the fields of educational computing and elementary and secondary school administration. Previously identified teacher competencies were also considered. The list of competencies was submitted for validation to a group of ten authorities in the fields of educational administration and computer science.

The ten selected authorities (Appendix F) in the fields of educational administration and computing are referred to as validation panel members throughout this study. The validation panel members were selected to review the

original list of proposed competencies (Appendix A). Due to the implications of the national significance of this study, the selection of the validation panel members was very critical to the study.

The validation panel members were selected on the basis of having made nationally recognized contributions to the field of administrative computing in the form of publications or presentations. Also considered in the selection process is recognition by a state or national organization for significant contributions to the use of computers in educational administration. Further consideration was given to their professional position and geographic location. The ten members selected have the following backgrounds: general superintendent, supervisor of instruction, data processing director, state department of education specialist for computing, school district computing coordinator, professor of educational administration, two professors of computer science, author of computer literacy materials for school administrators, and past president of the Association of Educational Data Systems (AEDS).

These authorities judged the initial list of thirty-five (35) competencies to determine which competencies were not appropriate and whether or not additional competencies should be added. It was required that eight panel members had to agree in order to omit a competency. Additional competencies (Appendix B) became part of the list based

upon the judgment of this group. An interview of each panel member by telephone was utilized to validate these additional competencies. All ten validation panel members responded to the thirty-five originally proposed competencies and to all nine additional suggested competencies.

Thirty-one professionals, directly involved in activities related to computer usage and administration, were selected to rate the importance of the forty-two competencies established by the validation panel. These professionals represented educational systems, college and university faculties, and educational computer vendors. Those in administration were selected further upon demonstrated computer literacy.

The evaluation panel (Appendix G) was composed of thirty-one members selected from three areas that include (a) educational administration, (b) college or university faculty members, and (c) computer vendors. They were selected on the basis of their being computer literate in educational administration. Eighteen of the evaluation panel members were practitioners in a field of education that utilizes computers; six panel members were faculty members in institutions of higher education, three of whom were from computer science and three were from educational administration; seven members represented leading computer vending companies, each of which named its representative.

These evaluation panel members rated each competency using a five-point scale of importance. Twenty-nine, or (93.5 %) of the evaluation panel members returned usable questionnaires. A mean rating was determined for each of the forty-two competencies and was used to rank the competencies.

Tabulations on data collected from the validation panel were made. Competencies that received a minimum of eight not acceptable ratings from the panel members were omitted from the study. A final list of forty-two competencies was established that were rated according to importance as viewed by the evaluation panel members. Mean ratings were computed for each competency based on the responses of evaluation panel members and were ranked in order of importance based on the mean ratings.

Data Findings

1. One original competency involving the writing of administrative programs was omitted from the study because it was unacceptable to the validation panel.

2. The general competency on assessing hardware was divided into two competencies. They are (a) assessing instructional hardware and (b) assessing administrative hardware, as proposed and validated by the validation panel.

3. Seven other additional competencies in two areas, literacy and educational, computing were proposed. They are

(a) personnel, (b) copyright laws, (c) future trends (d) computer ownership, (e) instructional training needs (f) administrative training needs, and (g) student training needs.

4. Although 3 competencies were judged as acceptable by only a minority of the validation panel members, they were not deleted from the study; these three competencies are (a) knowledge of responsibilities of personnel, (b) historical, and (c) explanation of software.

5. A final list of 42 computer competencies for school administrators was established; however, only 38 of these had mean ratings high enough to be considered of medium importance.

6. Five educational computing competencies are included in the 10 highest rated competencies. They are (a) justifying computing costs, (b) instructional training needs, (c) student training needs, (d) administrative training needs, and (e) identifying alternative uses.

7. Three literacy competencies are included in the 10 highest rated competencies. They are (a) values, (b) future trends, and (c) legal, moral and human issues.

8. Only one competency from the resources area is included in the 10 highest rated competencies. It is identifying funding sources.

9. Only one applications competency is included in the 10 highest rated competencies. It is indentifying tasks for computerization.

10. Four programming competencies are included in the 10 lowest rated competencies. They are (a) write simple programs, (b) explanation of software requirements, (c) awareness of instructional software, and (d) data processing stages.

11. Three applications competencies are included in the 10 lowest rated competencies. They are (a) planning an application, (b) assessing instructional hardware, and (c) designing a district plan.

12. Two literacy competencies are included in the 10 lowest rated competencies. They are (a) functions of hardware components and (b) historical.

13. Only one software-hardware competency is included in the 10 lowest rate competencies. It is using statistical software.

Conclusions

Based on the major findings of this study, the following conclusions appear to be warranted.

1. With the exception of several competencies listed below, all competencies established by this study appear to be those needed by school administrators.

2. School administrators do not need the ability to write programs for administrative applications.

3. Both the instructional and the administrative areas must be considered by administrators when evaluating and assessing hardware configurations.

4. Knowledge of computer expertise that appear to be unnecessary requirements for school administrators are knowledgeable of the role and responsibilities of data processing personnel, historical events in computing, and why programs will or will not run on a given computer.

Implications

The findings of this study suggest several implications for both school administrators and those that offer computer related college-university courses or workshops for school administrators. The participation of school administrators is vital to any determination of computer competencies needed by these administrators. However, the impact of a wider variety of groups also is necessary to prevent the omission of computer competencies important in school administration. In order not to omit competencies when developing computer workshops for elementary and secondary school administrators, it appears to be appropriate to group the competencies into manageable units of instruction.

The data provided by the questionnaires also seemed to indicate that instructional computing is of greater

importance to school administrators than administrative computing. This emphasis on instructional computing is further confirmed by the review of prior educational computing competency studies. If computers are going to be used fruitfully by school administrators in the future, some of the emphasis being placed on instructional computing will need to be taken away from this area and directed toward administrative computing. Attention may need to be given to the inclusion of specific applications involving the use of computers in workshops or courses that concentrate on administrative functions.

Though data collected from the validation panel indicate the acceptability of a competency, and data collected from the evaluation panel indicate the importance of a competency, some disagreement among authorities is indicated. Knowledge of the responsibilities of data processing personnel was judged not acceptable by five of the ten validation panel members; the same competency has a mean rating from the evaluation panel members that indicated it is above average importance. This difference indicates that disagreement exists on this topic. A further implication of this small disagreement is the fact that importance ratings may vary slightly depending on the background of each panel member.

Recommendations for Future Research

On the basis of the findings, conclusions, and implications of this study, it is recommended that the following studies be undertaken.

1. A set of measurable objectives should be developed for the competencies.

2. Instructional materials should be identified that could be used in college-university courses or workshops which inform school administrators about administrative and educational computing.

3. A competency-based tool should be designed that will determine the computer competency levels of school administrators.

4. Identification should be established regarding which competencies are appropriate for the various types of elementary and secondary school administrators (e.g., principals, assistant principals, counselors, supervisors, superintendents, and assistant superintendents).

5. Computing competencies should be identified for school administrators other than those in elementary and secondary schools, such as those in higher education.

6. A study should be made to determine why professionals in the field of school administration appear to be more interested in the instructional uses of computers rather than the administrative uses.

7. A study should be made to determine ways in which to accomplish an increased use of computers in school administration.

APPENDICES

APPENDIX A

ORIGINALLY PROPOSED COMPETENCIES

COMPUTER LITERACY COMPETENCIES
FOR
SCHOOL ADMINISTRATORS

Below is a list of thirty-five (35) competencies developed for school administrators. Please indicate your acceptance or rejection of the proposed competency by circling the appropriate number using the following scale:

- 1 = acceptable
- 2 = not acceptable
- 3 = no opinion

Please propose any competencies which you believe are omitted. Use the spaces after competency 35. If there are competencies which are not clear and which need restating, please do so following the additions.

An administrator should:

1. have a working knowledge of computer hardware and software terminology needed to communicate with data processing or computer professionals	1 2 3
2. be able to identify and discuss with the average lay person historical events in computing, particularly those related to education	1 2 3
3. be able to discuss legal, moral, and human impact issues of computing as they relate to societal uses of computers generally, and particularly educational uses	1 2 3
4. be able to discuss values and benefits of computerization in education and society	1 2 3
5. be able to identify, describe, and demonstrate the function and operation of the various components of computers and related peripheral devices	1 2 3
6. be able to identify the three stages of data processing input, processing, and output and the form data needs to be in for input or output	1 2 3

1 = acceptable
 2 = not acceptable
 3 = no opinion

7.	be able to write simple programs	1 2 3
8.	be able to write computer programs needed to perform educational administration tasks	1 2 3
9.	be able to explain why a program will or will not run on a given computer (ie. operating system, memory size, language of program, type of disk, etc.)	1 2 3
10.	be able to demonstrate an awareness of computer software systems such as authoring languages or utility programs, which are used for the development of computer-based instructional materials	1 2 3
11.	be able to demonstrate an awareness of operating systems, electronic spread sheets, accounting, data base management, sorting and word processing and similar software systems	1 2 3
12.	have experience planning an educational data processing application for school administration	1 2 3
13.	be able to determine the elements of a district plan for computer-based instruction	1 2 3
14.	have experience designing a district plan for computer-based instruction	1 2 3
15.	be able to describe appropriate instructional arrangements for computer-based learning experiences	1 2 3
16.	be able to discuss ways to integrate the use of computer-related instructional materials with non-computer instructional materials	1 2 3
17.	have experience evaluating and assessing hardware configurations which might be used in instructional and administrative applications	1 2 3
18.	be able to identify educational administration tasks that could be computerized	1 2 3
19.	be able to demonstrate an awareness of ways computers can assist in decision making	1 2 3

1 = acceptable
 2 = not acceptable
 3 = no opinion

20.	have experience using a computer terminal and menu driven programs to perform administrative tasks and generate reports	1 2 3
21.	be able to evaluate software and hardware for cost effectiveness, usefulness, and ease of use	1 2 3
22.	be able to evaluate instructional software	1 2 3
23.	be able to identify the components of a data base (ie. file, record, and field)	1 2 3
24.	have experience using a data base information management system to make inquiries and enter data	1 2 3
25.	be able to adapt nontechnical software such as word processing and electronic spread sheet to administrative functions	1 2 3
26.	have experience using statistical analysis software	1 2 3
27.	be able to identify possible sources that can be used to help in locating hardware and software needed to perform instructional tasks	1 2 3
28.	be able to identify possible sources that can be used to help in locating hardware and software needed to perform administrative tasks	1 2 3
29.	be able to identify sources of computing related literature for administrators	1 2 3
30.	be able to identify possible funding sources for instructional and administrative computing	1 2 3
31.	be able to identify various alternatives for using computers in instruction	1 2 3
32.	be able to differentiate between various forms of computer assisted instruction	1 2 3
33.	be able to characterize the use of the computer as an object of instruction, as an instructional medium, and as a problem-solving tool	1 2 3

- 1 = acceptable
- 2 = not acceptable
- 3 = no opinion

- 34. be able to demonstrate knowledge of the unique characteristics of computers which can facilitate learning 1 2 3
- 35. be able to justify the cost of educational computing 1 2 3

Please use the spaces below to propose any competencies which you believe are omitted. If there are competencies which are not clear and which need restating, please do so following the additions.

APPENDIX B

ADDITIONAL SUGGESTED COMPETENCIES

COMPUTER COMPETENCIES FOR
SCHOOL ADMINISTRATORS

Nine (9) additional competencies were suggested for school administrators. Please indicate your acceptance or rejection of the proposed competency by stating the appropriate number using the following scale:

- 1 = acceptable
- 2 = not acceptable
- 3 = no opinion

An administrator should:

1. have a working knowledge of the roles and responsibilities of various data processing personnel employed in a typical educational data processing center.	1 2 3
2. have a working knowledge of copyright laws as they apply to educational computing	1 2 3
3. be able to demonstrate an awareness of future trends in computing as they relate to educational computing	1 2 3
4. be able to identify the ongoing problems of computer ownership (maintenance, security, replacement, etc.)	1 2 3
5. have experience evaluating and assessing hardware configurations which might be used in instructional applications	1 2 3
6. have experience evaluating and assessing hardware configurations which might be used in administrative applications	1 2 3
7. be able to identify training needs of teachers for each of the uses listed in originally proposed competency 33.	1 2 3
8. be able to identify training needs of teachers and administrators related to the administrative uses of computers in education	1 2 3
9. be able to describe the computer training needs of students who will be entering the job market in the future	1 2 3

APPENDIX C

FINAL LIST OF COMPETENCIES

COMPUTER COMPETENCIES FOR SCHOOL ADMINISTRATORS

Below is a list of computer competencies for school administrators which have been validated by ten (10) nationally recognized leaders in the field of educational computing. Please indicate the importance you attach to each competency using the following scale:

- 5 = of extreme importance
- 4 = of high importance
- 3 = of medium importance
- 2 = of low importance
- 1 = of no importance

An administrator should:

1. have a working knowledge of computer hardware and software terminology needed to communicate with data processing or computer professionals 1 2 3 4 5
2. have a working knowledge of the roles and responsibilities of various data processing personnel employed in a typical educational data processing center. 1 2 3 4 5
3. be able to identify and discuss with the average lay person historical events in computing, particularly those related to education 1 2 3 4 5
4. have a working knowledge of copyright laws as they apply to educational computing 1 2 3 4 5
5. be able to discuss legal, moral, and human impact issues of computing as they relate to societal uses of computers generally, and particularly educational uses 1 2 3 4 5
6. be able to discuss values and benefits of computerization in education and society 1 2 3 4 5
7. be able to demonstrate an awareness of future trends in computing as they relate to educational computing 1 2 3 4 5

- 5 = of extreme importance
- 4 = of high importance
- 3 = of medium importance
- 2 = of low importance
- 1 = of no importance

8. be able to identify, describe, and demonstrate the function and operation of the various components of computers and related peripheral devices 1 2 3 4 5
9. be able to identify the ongoing problems of computer ownership (maintenance, security, replacement, etc.) 1 2 3 4 5
10. be able to identify the three stages of data processing input, processing, and output and the form data needs to be in for input or output 1 2 3 4 5
11. be able to write simple programs 1 2 3 4 5
12. be able to explain why a program will or will not run on a given computer (ie. operating system, memory size, language of program, type of disk, etc.) 1 2 3 4 5
13. be able to demonstrate an awareness of computer software systems such as authoring languages or utility programs, which are used for the development of computer-based instructional materials 1 2 3 4 5
14. be able to demonstrate an awareness of operating systems, electronic spread sheets, accounting, data base management, sorting and word processing and similar software systems 1 2 3 4 5
15. have experience planning an educational data processing application for school administration 1 2 3 4 5
16. be able to determine the elements of a district plan for computer-based instruction 1 2 3 4 5
17. have experience designing a district plan for computer-based instruction 1 2 3 4 5
18. be able to describe appropriate instructional arrangements for computer-based learning experiences 1 2 3 4 5

5 = of extreme importance
 4 = of high importance
 3 = of medium importance
 2 = of low importance
 1 = of no importance

19. be able to discuss ways to integrate the use of computer-related instructional materials with non-computer instructional materials 1 2 3 4 5
20. have experience evaluating and assessing hardware configurations which might be used in instructional applications 1 2 3 4 5
21. have experience evaluating and assessing hardware configurations which might be used in administrative applications 1 2 3 4 5
22. be able to identify educational administration tasks that could be computerized 1 2 3 4 5
23. be able to demonstrate an awareness of ways computers can assist in decision making 1 2 3 4 5
24. have experience using a computer terminal and menu driven programs to perform administrative tasks and generate reports 1 2 3 4 5
25. be able to evaluate software and hardware for cost effectiveness, usefulness, and ease of use 1 2 3 4 5
26. be able to evaluate instructional software 1 2 3 4 5
27. be able to identify the components of a data base (ie. file, record, and field) 1 2 3 4 5
28. have experience using a data base information management system to make inquiries and enter data 1 2 3 4 5
29. be able to adapt nontechnical software such as word processing and electronic spread sheet to administrative functions 1 2 3 4 5
30. have experience using statistical analysis software 1 2 3 4 5
31. be able to identify possible sources that can be used to help in locating hardware and software needed to perform instructional tasks 1 2 3 4 5

- 5 = of extreme importance
 4 = of high importance
 3 = of medium importance
 2 = of low importance
 1 = of no importance
32. be able to identify possible sources that can be used to help in locating hardware and software needed to perform administrative tasks 1 2 3 4 5
 33. be able to identify sources of computing related literature for administrators 1 2 3 4 5
 34. be able to identify possible funding sources for instructional and administrative computing 1 2 3 4 5
 35. be able to identify various alternatives for using computers in instruction 1 2 3 4 5
 36. be able to differentiate between various forms of computer assisted instruction 1 2 3 4 5
 37. be able to characterize the use of the computer as an object of instruction, as an instructional medium, and as a problem-solving tool 1 2 3 4 5
 38. be able to demonstrate knowledge of the unique characteristics of computers which can facilitate learning 1 2 3 4 5
 39. be able to justify the cost of educational computing 1 2 3 4 5
 40. be able to identify training needs of teachers for each of the uses listed in competency 37. 1 2 3 4 5
 41. be able to identify training needs of teachers and administrators related to the administrative uses of computers in education 1 2 3 4 5
 42. be able to describe the computer training needs of students who will be entering the job market in the future 1 2 3 4 5

APPENDIX D

LETTER TO VALIDATION PANEL MEMBERS

(Name and title)
(Address)

Dear (title and name):

Ted Mims, a doctoral candidate, and I are engaged in a study of computer competencies needed by school administrators. Through this study we hope to determine computer competencies needed by school administrators.

As part of this research, we are mailing the enclosed survey form to a group of ten (10) nationally recognized leaders in the field of educational computing for administrators. Would you please take a few moments of your time to complete the survey and return it by February 11th. Since there are only a limited number of people we feel that are qualified to serve in this group of ten, your response will be a crucial and valuable aspect of this research study. You need not identify yourself on the form. Individual responses will be held in confidence.

A stamped, self-addressed envelope is enclosed for your convenience in returning the completed survey. You may receive a summary copy of this study by mailing the enclosed post card.

Your participation in this study will be properly acknowledged and appreciated.

Sincerely,

Jim Poirot, Chairman
Department of Computer Sciences

JP:sd

enclosures

APPENDIX E

LETTER TO EVALUATION PANEL MEMBERS

(Name and title)
(Address)

Dear (title and name):

Ted Mims, a doctoral candidate, and I are engaged in a study of computer competencies needed by school administrators. Through this study we hope to determine computer competencies needed by school administrators.

Enclosed is a short survey form of competencies which have been validated by ten (10) nationally recognized leaders in the field of educational computing for administrators. Would you please take a few moments of your time to complete the survey and return it by April 1, 1983. You were selected from a limited number of people we feel are qualified to judge these competencies, your response will be a crucial and valuable aspect of this research study. You need not identify yourself on the form. Individual responses will be held in confidence.

A stamped, self-addressed envelope is enclosed for your convenience in returning the completed survey. You may receive a summary copy of this study by mailing the enclosed post card.

Your participation in this study will be properly acknowledged and appreciated.

Sincerely,

Jim Poirot, Chairman
Department of Computer Sciences

JP:sd

enclosures

APPENDIX F

NAMES OF VALIDATION PANEL MEMBERS

Dr. Gary Bitter
Payne B203
Arizona State University
Tempe, Arizona 85287

Dr. John Bristol
Superintendent
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APPENDIX G

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APPENDIX H

SOURCES OF COMPETENCIES

Competency	Source*
1. Terminology	E
2. Knowledge of responsibilities of personnel	V
3. Historical	E
4. Knowledge of copyright laws	V
5. Legal, moral and human issues	E
6. Values	T
7. Future trends	V
8. Functions of hardware components	T
9. Problems of ownership	V
10. Data processing stages	R
11. Write simple programs	E
12. Explanation of software requirements	P
13. Awareness of instructional software	T
14. Awareness of administrative software	T
15. Planning an application	T
16. Elements of a district plan	T
17. Designing a district plan	T
18. Describe instructional arrangements	T
19. Ways to integrate computer and non-computer materials	T
20. Assessing instructional hardware	V
21. Assessing administrative software	V
22. Identifying tasks for computerization	T
23. Awareness of computer decision-making	R
24. Experience using programs	E

Competency	Source*
25. Evaluating software and hardware	T
26. Evaluating instructional software	T
27. Identifying components of a data base	R
28. Using a data base management system	R
29. Adapting software for administration	T
30. Using statistical software	R
31. Identifying sources of support for instructional computing	E
32. Identifying sources of support for administrative computing	E
33. Identifying sources of related literature	T
34. Identifying funding sources	P
35. Identifying alternative uses	T
36. Differentiate between forms of CAI	T
37. Characterize instructional uses	T
38. Knowledge of instructional characteristics	T
39. Justifying computing costs	P
40. Instructional training needs	V
41. Administrative training needs	V
42. Student training needs	V

*E = Elementary and Secondary Schools Subcommittee task group on computing competencies for teachers, P = professionals in the educational computing, R = related literature, T = Texas Educational Agency unpublished report on computing competencies for educators, V = validation panel.

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