The implementation and evaluation of an electronic communication network for student teachers

by

Nancy Anne Burkland Carley

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CHAPTER I. INTRODUCTION

Background

A major concern within the field of education continues to be the professional isolation and alienation of teachers. Goodlad (1983) reports that teachers are generally confined to their classrooms and are unable to converse with other educators about problems or concerns. A study at the University of Central Florida provides further evidence of this problem (Griffin, 1984). In this study, 196 teachers enrolled in the College of Education graduate program were asked to complete a survey. Over 80% of the teachers indicated that their classrooms were private worlds that nobody besides themselves or their students entered. In addition, the teachers reported that formal and informal visits to their classrooms by peers or evaluators were rare, as were their own visits to the classrooms of other teachers. These findings seem to indicate that many teachers do feel isolated from other educators.

The problem of teacher isolation can be especially acute for new teachers. Beginning teachers are given the same responsibilities as experienced educators while they are still in the process of adjusting to their new roles (Houston & Felder, 1982). Many times, the new teachers are hesitant to ask the experienced teachers for help and the veteran teachers are reluctant to offer their assistance (Newberry, 1978). Thus, beginning educators are often left to solve problems frequently encountered by new teachers on their own. Lortie (1975) states that "compared with the crafts, professions, and highly skilled

trades, arrangements for mediated entry are primitive in teaching" (p. 59). Unfortunately, Houston and Felder (1982) report that "the conditions under which a new teacher is inducted will in all likelihood strongly influence the attitudes and effectiveness of that teacher over his or her entire career" (p. 459). Given the seriousness of this statement, it is not surprising that the authors recommend a more supportive environment for beginning educators along with a gradual induction into the responsibilities of the teaching profession (Houston & Felder, 1982).

A wide variety of solutions have been proposed in the past in order to help new teachers cope with the isolation problem (Houston & Felder, 1982; Rothberg, 1985). A recent solution involves the establishment of computer networks that link experienced educators at universities and in classrooms with beginning teachers in the field through telecommunications. In most cases, the participants communicate with each other by connecting with a host computer using personal computers and modems. They enter messages on their personal computers that are transmitted over the phone lines and saved on the host for other users to access. The participants may send and receive private messages addressed to specific individuals or they may post and respond to public messages of general interest to all users on the system. The experienced educators act as mentors for the beginning teachers by providing support and offering suggestions on topics like classroom management, teaching strategies, and resource materials. The beginning teachers can also communicate with each

other and discuss shared problems or concerns. Ideally, the network becomes an electronic support system for beginning educators.

Electronic communication networks for teachers are beginning to appear in various locations around the world. The networks are usually designed for a particular group of users such as student teachers, teachers, or educators participating in a certain training program. They basically share the same purpose of linking educators together. However, the networks do vary in the number of services or options that they offer the teachers. Some networks that are currently in operation will be described in the remainder of this section.

The College of Education at the University of Michigan is one site where an electronic network for student teachers has been developed (Canning,1988; Swift & Coxford, 1988). This project involves the linking of 80 student teachers in the field with outstanding teachers and administrators and the University of Michigan faculty. Swift and Coxford (1988) state that the main purpose for creating the system was "to permit professional teachers, student teachers, and university faculty and staff of various backgrounds to interact and discuss questions about teacher preparation and to provide a system of support for student teachers" (p. 4). This system allows the users to communicate with each other by sending and receiving public and private messages. In addition, electronic conferences are frequently held on the network. The conferences focus the discussion in a particular section of the network on a specific topic such as mathematics.

A similar project for teachers is in progress at the University of New Mexico (Bruder, 1988). CISCO-Net (Computers in Science Classrooms) was originally designed to link together thirty-five science teachers in remote areas around the state. The teacher oriented network has expanded to 375 users and includes participants from seventy-five out of the eighty-eight school districts in the state. In addition to electronic messaging, CISCO-Net offers several services with a focus on science. These services include two basic programming and reading courses, bulletin boards, student advisement, an electronic magazine, and sixteen databases for use by the teachers.

An electronic network has also been developed for teachers participating in a summer training program at California State University in San Bernardino (Schrum, 1988). The network is part of the program ESTTI (Elementary Summer Technology Training Institute). This program is designed to promote the use of technology in California schools by providing training for approximately 200 leading educators during each summer vacation. The reasons for including telecommunications in this program are to help the teachers learn to use the technology and to provide a means for continuing communication after the summer training sessions are completed. The network enables the educators to communicate with each other via electronic messages and to discuss specific issues in electronic conferences.

Electronic networks are also being established to link educators together in other parts of the world. In Ireland, the NITEC (National

Information Technology in Education Centre) network has been created with the purpose of helping teachers learn about new information technologies (Resta, 1988). In addition to enabling the teachers in Ireland to communicate with each other and university faculty, NITEC allows them to download software and access databases. A similar service is being offered to teachers in Sweden (Resta, 1988). SkolKOM provides teachers and teacher trainees in the country with electronic messaging capabilities. A wide variety of databases are also on-line for the teachers and students to access and utilize in the classroom.

Statement of the Problem

Since the idea of connecting new teachers with other professional educators via electronic communication networks is relatively new, there is a lack of empirical data pertaining to the usage and value of these systems. Resta (1988) reports that there is a critical need for the following questions to be answered about electronic networks for teachers:

"1. How often are the networking services used, by whom, and for what purposes?

2. If funded by private sources, is there a plan and commitment for the using schools, institutions, or educational agencies to continue the services in the future out of their operational budgets?

3. Is there evidence that the services provided actually improve teacher (or student) skills and knowledge or reduce the professional isolation of teachers?

4. Do teachers think the services are important and want them continued?" (p. 56).

Based on the information above, it is clear that there is a need to examine the usage and value of electronic communication networks as support systems for educators.

Purposes of the EEE

The College of Education at Iowa State University is also attempting to bridge the gap between the world of practice in the classroom and the education faculty at the university with an electronic communication network entitled the Electronic Educational Exchange (EEE). The EEE is designed to serve the following purposes.

I. Provide a convenient method for the exchange of ideas between student teachers and Iowa State faculty.
   - A. To decrease the sense of isolation often encountered by student teachers.
   - B. To make faculty expertise readily available to student teachers.
   - C. To increase education faculty awareness of the problems frequently encountered by student teachers.

II. Provide telecommunications experience for student teachers and Iowa State faculty.

Purpose of the Study

During the fall semester of 1988, a group of student teachers were involved in a pilot study in which they utilized the EEE to communicate

with their peers, student teaching supervisors, and ISU faculty members. The purpose of this study was to examine the usage and value of electronic communication networks as support systems for beginning teachers.

Research Questions

The student teachers completed one survey prior to their experience with the EEE and another one at the end of their experience. In addition, the ISU faculty and supervisors completed a final survey at the end of their experience with the EEE. Six of the faculty members and supervisors were interviewed to obtain further information on the system. Records were also kept of the amount and type of interactions on the EEE by analyzing the system's callerlog and the subject headings in the message files. The following research questions were considered when analyzing the data.

User Characteristics:

1. What are the characteristics of the people who use the EEE?

Usage:

2. How often does the average user call the EEE? Do student teachers with previous computer experience utilize the EEE more often than student teachers without previous computer experience?

Interactions:

3. What type of interactions take place on the EEE?

Preparation:

4. Was the preparation the student teachers received for utilizing the EEE adequate?

Computer Attitude:

5. Did the student teachers' experience with the EEE influence their attitude toward personal or educational applications of the computer? Are student teachers more likely to utilize other computer activities in their classrooms in the future because of their experience with the EEE?

Usefulness:

6. Do student teachers believe that the EEE is a useful tool for communicating with their peers, university supervisors, and ISU faculty?

Faculty Reactions:

7. Do the ISU faculty believe they are gaining useful information about the student teachers' experiences in the field from the EEE?

Modifications:

8. How should the EEE be modified to better serve the needs of new teachers and university faculty and supervisors as an effective communication tool?

Limitations

A limitation of this study was the lack of sufficient hardware to support the project. Due to a limited number of modems available for use in the schools and the type of telephone lines installed in the

school offices, the number of student teachers who were able to connect with the EEE was reduced to thirty-five out of eighty-one. In addition, the host computer for the EEE was only capable of handling one caller at a time. Therefore, during peak usage times such as after school the phone line was frequently busy which discouraged users from calling the system.

A related limitation was the large number of student teachers in Ames using the EEE. These schools had the necessary equipment and phone lines for accessing the system; however, the student teachers in Ames were not geographically isolated from their peers, supervisors or university faculty. Thus, it is difficult for these people to realize the potential of this type of system as an effective communication tool.

Definitions

Bulletin Board System (BBS): A computerized system that allows multiple users to post and respond to public or private messages. This term is interchangeable with electronic communication network.

Callerlog: A file on an electronic communication network that contains a record of the callers' names, the time they logged on, the number of messages they sent, and the time they logged off.

Conference: A public section on an electronic communication network where the conversation is focused on a specific issue.

Electronic Communication Network: A computerized system that allows multiple users to post and respond to public or private messages. This term is interchangeable with bulletin board system.

Electronic Mail (E-Mail): A term for a private message on an electronic communication network.

Host Computer: The computer that controls the operation of an electronic communication network.

Modem: A device that allows a computer to transmit or receive data over the telephone lines.

Telecommunications Software: Any software that enables a computer to communicate with another computer over the telephone lines.

Userlog: A file that contains the names and other personal data for each user on an electronic communication network.

Summary

In order to address the problem of teacher isolation, telecommunications networks are being established that link experienced educators at universities and in classrooms with beginning teachers in the field. The Electronic Educational Exchange at Iowa State University was created to fulfill this purpose. A pilot study was conducted during the fall semester of 1988 in which a group of student teachers utilized the EEE to communicate with their peers, student teaching supervisors, and ISU faculty members. Since the idea of connecting new teachers with other professional educators via electronic communication networks is relatively new, there is a lack of empirical data pertaining to the usage and value of these systems. The purpose of this study was to examine the usage and value of electronic communication networks as support systems for beginning teachers.

CHAPTER II. LITERATURE REVIEW

This literature review begins with a presentation of the research on teacher isolation. This is followed by a discussion on the role that electronic communication networks may play in addressing the problem. Next, several existing networks created for this purpose are described. Advantages of electronic communication and suggestions for meeting potential challenges in implementing an electronic communication system are discussed. Finally, the need for research on the usage and value of these systems is explained.

Teacher Isolation

Considerable research has been conducted on the professional isolation and alienation of teachers. Due to the physical structure of schools and the daily schedules of educators, teachers are often restricted to their own classrooms and are unable to interact with other colleagues (Flinders, 1988; Goodlad, 1983; Lortie, 1975). For this reason, teaching has been referred to as the "lonely" profession (Sarason, 1966).

Griffin (1984) provides additional insight into the problem of teacher isolation based on a study at the University of Central Florida. In this study, 196 teachers enrolled in the College of Education graduate program were asked to complete a survey. This sample consisted of 73 elementary teachers, 36 junior high teachers, and 87 high school teachers. The results of the survey indicated that over 80%

of the teachers felt that their classrooms were "private worlds" that nobody besides themselves or their students entered. Congruent with this, the teachers reported that they were rarely observed by their peers or evaluators. Over half of the elementary and junior high teachers said they would like other educators to observe their classrooms. Likewise, the teachers indicated that they seldom visited other classrooms to observe or participate. When asked if they would like to visit other classrooms, 80% of the elementary and junior high teachers responded favorably. The majority of the high school teachers were undecided as to whether they wanted to be observed by other educators and visit the classrooms of other teachers. A large majority of all participants felt that their good work frequently went unnoticed and that they were self-motivated to do a good job. Based on these results, it would seem that many teachers do feel isolated from other educators.

The problem of teacher isolation seems to have a greater impact on beginning educators as they face many challenges during their first years of teaching. First-year teachers experience an abrupt entry into the world of teaching as they are expected to assume the same responsibilities as experienced educators while they are still in the process of adjusting to their new roles (Houston & Felder, 1982; Lortie, 1975). Stone (1987) reported that first year teachers go through an experience labeled "reality shock". In other words, many new educators begin their first teaching assignments with unrealistic expectations and become frustrated when they realize their perceptions were incorrect. In addition, many beginning teachers said

that teaching was more difficult and required more time and energy than they had expected (Lortie, 1975).

Given the many challenges that beginning educators face, it would seem likely that experienced educators in their school would be an excellent resource for solutions to some of their problems. However, Newberry (1978) described a barrier that exists between beginning and experienced teachers. Many times, the new teachers are reluctant to ask the experienced educators for help because they feel it would be viewed as a sign of their incompetence as a teacher. In addition, Lortie (1975) reported that younger teachers prefer to receive help from their peers or those closest to them in rank. However, many times, there may only be one beginning teacher in a particular school. Likewise, the veteran teachers are reluctant to offer their assistance because they are afraid it would be interpreted as an attempt to interfere (Newberry, 1978). With the ties from the teacher training institution broken and the inability to draw upon the experience of the veteran educators in their school, many new teachers are forced to deal with their problems alone.

These circumstances lead some new educators to question if they have chosen the right career (Houston & Felder, 1982). Unfortunately, these early experiences can have a strong impact on the teachers' performances throughout their entire career (Houston & Felder, 1982). Stone (1987) stated that "approximately 50% of those who take jobs as teachers leave the profession within five years" (p. 34). Furthermore, she reported that "the most academically able are among the first to

leave education" (Stone, 1987, p. 34). The problem of teacher isolation may cause some of these teachers to choose another career. In an effort to address these problems, several researchers have recommended a more supportive environment for beginning teachers along with a gradual induction into the responsibilities of the teaching profession (Goodlad, 1983; Houston & Felder, 1982; Stone, 1987).

Based on the previous research, it is clear that some type of support system is necessary for beginning educators. Several suggestions for support systems have been made in the past. Griffin (1984) and Stone (1987) recommended a group problem solving approach within the school to help reduce teacher isolation. Stone (1984) suggested providing a "buddy" or mentor for new teachers by pairing them up with a successful veteran teacher in the school. The mentor should be teaching at a similar grade level and her room should be located fairly near the beginning teacher's room. Another suggestion involves forming a league of schools to enable personnel from various schools to come together and exchange information with a focus on the quantity and quality of the communication (Tye & Tye, 1984). This idea was implemented in order to help identify effective ways of linking schools and teachers to outside knowledge.

Electronic Communication Networks

A recent solution to the problem of teacher isolation involves the development and implementation of electronic communication networks that link beginning teachers in the classroom with each other

and with experienced educators in other schools and universities. The network participants usually communicate with each other by using a personal computer and a modem to connect with a host computer. The users enter messages on their computers that are transmitted over the telephone lines to the host computer where they are saved for the appropriate user(s) to access. The participants may send and receive private messages that are addressed to a specific person on the system or they may post and respond to public messages of general interest to all users on the system. These networks enable beginning teachers to discuss common problems or concerns with other new teachers on the system. In addition, the experienced educators on the system act as mentors for the new teachers by offering guidance on topics of concern. Ideally, the network becomes an electronic support system for beginning educators.

Several networks for educators that are currently in operation are described in the following sections. All of the networks share the purpose of linking educators together to provide group support and the opportunity to exchange information. However, the networks do vary in the number of services offered to the participants. In addition, the systems are usually developed for use by a specific group of educators. For example, one system might be developed for use by science teachers while another system may serve the communication needs of educators participating in a training program. The networks described in the following paragraphs are grouped together based on the type of users they serve.

Networks for teachers

Alaska has connected its educators through a statewide computer network entitled University of Alaska Computer Network (UACN) (Seguin, 1988). The network enables teachers in remote areas around the largest state to communicate with other educators over great distances. The system offers electronic messaging capabilities and several bulletin boards focused on educational issues. Electronic mail is the most heavily used component of the system. In fact, a course called Using Electronic Mail in Education is offered on UACN. The emphasis of the course is on self-reliance and how to navigate around the system. The network consists of interconnected VAX 8600 and 8800 series computers located in Anchorage, Juneau, and Fairbanks with approximately 70 dial up lines. Several hundred terminals located around the state provide access to the system. All of the 56 school districts in Alaska are connected to UACN. The network links together over 6000 teachers, university professors, and employees at public school district offices.

CISCO-Net (Computers in Science Classrooms) is a teacher oriented network with a focus on science that was established at the University of New Mexico (Bruder, 1988). The project was initially developed to link together 35 science teachers in remote locations around the state. However, it has expanded to 375 users and reaches 75 of the 88 school districts. A toll-free number eliminates line charges for users within the state. The system offers programming and reading courses, bulletin boards, and 16 databases for the teachers to access.

The Educational Technology Center (ETC) in Cambridge, Massachusetts has also developed and implemented a communication network to enable science teachers to share information and discuss ideas (Katz et al., 1987). It is called the Science Teachers' Network. Common Ground, the software package that manages the host computer was developed at ETC. The package is designed to run on a microcomputer and is currently available for IBM PCs, XTs, and DEC Rainbow computers. The system supports private messaging and conferencing capabilities and is designed to be easy to use for participants with little computer experience.

Networks for beginning educators

UNCLE (UNC Link to Educators) is the name of another electronic network that is located at the University of Northern Colorado (Lounge & Walker, 1988). The network was created to promote communication, sharing of resources, and support among educators. The system connects university professors, classroom teachers, student teachers, and parents with a focus on offering support for beginning teachers and student teachers. UNCLE offers electronic mail and computer conferencing to the participants on the system.

The University of Michigan has also implemented a communications network for student teachers on the university's mainframe computer (Swift & Coxford, 1988). The users include approximately 25 experienced educators, 20 university faculty members, and 80 student teachers. The purpose of the network is to provide a support system

for the student teachers and promote discussion on the quality of teacher preparation between the student teachers, classroom teachers, and university professors. The system enables educators to communicate with each other by sending public or private messages. Simultaneous communication between two or more people on the system can also be arranged. In order to encourage initial usage, questions that were related to the student teachers' weekly seminar work were posted on the system and the student teachers were required to respond to the questions. However, the student teachers also initiated questions on their own concerning teaching strategies, learning activities, and classroom management.

Networks incorporated into inservice programs

An electronic network for teachers participating in a summer training program has been developed at California State University in San Bernardino (Schrum, 1988). The training program is entitled Elementary Summer Technology Training Institute (ESTTI). The purpose of the program is to promote the use of technology in California schools. The network was incorporated as part of the program in order to introduce the participants to the technology and facilitate communication among the group during the school year. The network is part of the McGraw-Hill Information Exchange (MIX) system that serves K-12 educators. The 200 teachers involved in the program can communicate with each other by sending private messages to

specific individuals on the system or by participating in conferences that are open to all users on the network.

The New Jersey Departments of Education and Higher Education developed a program "to effectively inservice and improve the classroom instruction of secondary science teachers" (Bloom & Rabinowitz, 1985, p. 2). One component of this program includes an electronic network to maintain contact between participants, offer group support, and provide access to experts in the field. The network is entitled Electronic Information Exchange System (EIES). The host computer for the network is located at the New Jersey Institute of Technology and offers electronic mail and conferencing capabilities.

National networks

The McGraw-Hill Information Exchange (MIX) is a network that links educators together all over the country (Larsen, 1988). Most teachers utilize the network to exchange ideas on improving the curriculum in their schools. The conferences for teachers on the system fall into two main categories. One section deals with curriculum concerns and the other section focuses on issues related to professional growth.

Networks around the world

Electronic communication networks for educators are also being established in other parts of the world. In Ireland, a network entitled the National Information Technology in Education Centre (NITEC) is

being implemented for teachers (Resta, 1988). The purpose of the network is to support the introduction of new information technologies. The network will enable teachers to download software, access databases, and communicate with other educators and university personnel.

A similar system is in operation in Sweden (Resta, 1988). In addition to on-line databases, a communication system called SkolKOM has been developed for teachers and teacher trainees. The network offers electronic messaging and conferencing capabilities for the educators.

All of the electronic communication networks described above were developed to link educators together for the purpose of sharing information and providing group support. As previously mentioned, the networks do vary in the type of services that are available for the educators. All of the networks include the capability to communicate with a specific individual on the system through electronic mail. Another common feature is electronic conferencing where several users respond to issues of general interest that are posted on the system. Additional services that are offered by some systems include access to databases, on-line courses, and educational software that may be downloaded from the host computer. The networks may also vary on the type of users for which they are intended. This may range from teachers in general to educators involved in a summer training program. However, by drawing upon the experience of those who have implemented the above networks, some of the benefits of this type of

communication can be identified as well as suggestions for meeting initial challenges in establishing an electronic communication network.

Benefits of Electronic Communication Networks

One common question that needs to be addressed is what value do electronic communication networks have for the participants. Katz et al. (1987) evaluated the value of the Science Teachers' Network that was developed at Educational Technology Center to the teachers that were utilizing it. The participating teachers were asked how the network had served their interests. The two most common responses to this question were the opportunity to communicate with colleagues and obtaining specific information on the network. In addition, participants on the Electronic Information Exchange System (EIES) were asked about the positive aspects of using the system (Bloom & Rabinowitz, 1985). They stated that the network demonstrated the value of microcomputers and electronic communication. Bloom and Rabinowitz (1985) also found that the group of EIES participants who were most favorable toward the system was significantly more active than any of the other groups when considering the number of messages sent, the number of conferences read, and the total number of interactions on the system.

Another important question that needs to be considered is what benefits do electronic communication networks have over conventional methods of communication. The following is a list of advantages for electronic networks.

1. The new teachers can ask a question at their convenience without playing telephone tag, scheduling an appointment, or waiting in line to meet with another educator (Downing et al., 1988; Knapp, 1987).

2. The questions and answers can be more precise and organized as both parties have more time to phrase them (Downing et al., 1988).

3. The faculty members become more aware of the types of problems encountered by beginning teachers in the classroom and can modify the curriculum at the university to help alleviate these problems (Downing et al., 1988).

4. Several educators can offer suggestions to a particular problem; thus, increasing the chances of identifying an effective solution (Knapp, 1987).

5. The system provides a less threatening method for asking questions than face to face communication (Knapp, 1987).

Suggestions for Implementing a Network

Despite these advantages, a recurring theme within these projects is the initial challenge of getting the users logged onto the system and using it effectively (Bloom & Rabinowitz, 1985; Downing et al., 1988; Katz et al, 1987; Schrum, 1988). Fulfilling this challenge involves providing a group purpose for accessing the system, adequate hardware accessibility and technical support, training and help sessions focused on using the particular system, and intense people support to facilitate interactions on the system. Some suggestions for implementing these

recommendations can be made by drawing upon the experience of others who have met this challenge.

First, Katz et al. (1987) stated that "the main challenges of a network seem to be human ones of defining a purpose and structure for interactions" (p. 40). Riel (1989) provided further support for this idea when she said "A crowd of people which only shares an ability to communicate is not a group; it lacks organization and shared purpose" (p. 4). Riel (1989) continued by explaining that group organization and shared purpose are vital aspects for electronic networks. The network architects must determine the structure and goals of the potential users in order to design a system that will help the participants achieve their goals.

Katz et al. (1987) reported that there have been two major problems stated by teachers who have utilized an electronic communication network in the past. The first problem mentioned was inadequate access to the hardware to connect with the system. It is essential to make the hardware for connecting with the host system as available as possible (Schrum, 1988). The equipment should be placed in a convenient location that is accessible at all times. If this recommendation is not met, it will be difficult for the educators to access the system when they need to use it. In addition, the host computer must have a sufficient number of incoming phone lines to support the users on the system (Resta, 1988). The second problem was that the teachers felt intimidated by computers. Thus, one important consideration in designing a system is make it easy to use for

people with little computer experience (Katz et al. 1987; Resta, 1988). Katz et al. (1987) also stated that the teachers on their network had difficulty utilizing the telecommunications software that enabled them to connect with the host computer. Therefore, it is recommended to select user friendly telecommunications software and encourage the participants to utilize the same kind of software so they can help each other.

The third challenge involves providing adequate training and support for using the particular system. Katz et al. (1987) recommended group training sessions demonstrating the procedures for sending and receiving messages on the particular system that the teachers will be utilizing. In addition, Schrum (1988) recommended identifying the teachers who have had previous experience with computers or telecommunications. These people can be given additional training to help prepare them to assist other educators on the use of the system. More extensive preparation can be provided to new users as more people become qualified to help them. Preparation for all users might involve the installation of a modem, practice on a simulated system, and on-line time with the actual system. It is also important to provide off-line help sessions when educators can discuss any problems they are having with the system. In addition to the training sessions, a help command on the system that explains the function of a menu option is recommended (Katz et al., 1987). The system operator may also provide on-line help by guiding the user through the system using the synchronous communication capabilities

that are available on most host computers (Katz et al., 1987). Other ideas for providing support for users include telephone assistance and a conference section on the system dedicated to technical difficulties that users may be having (Katz et al., 1987).

Finally, it is necessary for intense people support to facilitate interactions on the system. Katz et al. (1987) stated that one difference between successful and unsuccessful networks is "the amount of attention paid to the human, nontechnical aspects" (p. 2) of the system. They suggested initial face to face meetings to help network participants establish a group rapport. In addition, Kerr and Hiltz (1982) stated that users must receive messages in private mail if the network is to be successful. The system operator can facilitate this by communicating frequently with new users and informing participants of other users on the system with similar interests (Katz et al., 1987). In order to further facilitate interaction on a network, it is necessary for the users to become acquainted with each other and share information in public mail and conference sections on the system (Katz et al., 1987). System usage information collected on the EIES and ETC networks has demonstrated that the initial mode of communication on the systems was through private mail (Bloom & Rabinowitz, 1985; Katz et al., 1987). Katz et al. (1987) indicated that initially teachers may feel more comfortable communicating privately with previous acquaintances on the system. One suggestion for helping users become acquainted with each other involves the development of a section on the system where users enter a "biography" describing themselves and their

interests. The purpose of this is to help the users identify other participants on the system with similar interests. Another idea is to include a menu option that lists all of the users on the system. The face to face meetings described above also provide an excellent means for helping users to get acquainted with each other.

All of the above suggestions are recommended to help meet the initial challenges of getting participants logged onto an electronic communication network and using it effectively. The suggestions are aimed at providing a group purpose for accessing the system, adequate hardware accessibility and technical support, training and help sessions focused on using the particular system, and intense people support to facilitate interactions on the system.

Need for Research on Electronic Communication Networks

Since the idea of connecting beginning educators with other professional educators using electronic communication networks is relatively new, there is a lack of empirical data pertaining to the usage and value of these systems. There is a critical need for the following questions to be answered about electronic networks for teachers (Resta, 1988).

"1. How often are the networking services used, by whom, and for what purposes?

2. If funded by private sources, is there a plan and commitment for the using schools, institutions, or educational agencies to continue the services in the future out of their operational budgets?

3. Is there evidence that the services provided actually improve teacher (or student) skills and knowledge or reduce the professional isolation of teachers?

4. Do teachers think the services are important and want them continued?" (p. 56).

These questions are the basis for the research on the Electronic Educational Exchange (EEE) at Iowa State University.

Summary

Research has shown that many educators feel professionally isolated. The problem of teacher isolation can be especially acute for beginning teachers as they face many challenges during their first year of teaching. With the contact from the teacher training institution broken and the barrier that exists between beginning and experienced educators, many new teachers are forced to face these problems alone. Unfortunately, these early experiences can have a strong impact on a teacher's career. Thus, a more supportive environment for beginning teachers along with a gradual induction into the responsibilities of teaching have been recommended.

A recent solution to the problem of teacher isolation involves the establishment of electronic communication networks that link beginning teachers in the field with experienced educators in classrooms and at universities. Ideally, these networks become electronic support systems for beginning educators.

Several electronic networks for educators are currently in operation. All of the networks share the same purpose of linking educators together to provide group support and the opportunity to exchange information. The value of these networks for the participants as well as some of the benefits of these systems were discussed. In addition, suggestions to help meet the initial challenges of getting participants logged onto an electronic communication network and using it effectively were offered. The chapter concluded with a discussion on the need for research on the usage and value of electronic communication networks for educators.

CHAPTER III. METHODOLOGY

The purpose of this study was to examine the usage and value of electronic communication networks as support systems for beginning teachers. In this study, information was collected on the use and value of the Electronic Educational Exchange as a communication tool for Iowa State student teachers, supervisors, and faculty members. This chapter begins with a description of the sample involved in the study and the instruments that were utilized to collect the data. Next, the procedures that were followed to set up the system, implement it, and evaluate it are presented. The chapter concludes with a discussion on the plans for data analysis.

Sample

Eighty-one elementary education student teachers in the central Iowa area were invited to use the Electronic Educational Exchange during the fall semester of 1988. Because of the large number of people included in this group, thirty-two student teachers were selected to receive special support services for utilizing the system. These student teachers were located in eight different elementary schools in Ames, Iowa and one elementary school in Des Moines, Iowa. There were two criteria for selecting the student teachers who received special support services. First, the amount of equipment available in the participating elementary schools to support the project was considered. The necessary equipment included a computer, a

modem, telecommunications software, and an available telephone line for after school hours. Five modems were available to be loaned to the target schools if necessary. The second consideration was the ability of the university supervisors assigned to the participating schools to access the system frequently and conveniently to communicate with their student teachers. This requirement included the supervisors who had a computer at home or were on campus two to three times a week so they could utilize the terminals located on campus. The special support services that were offered to these student teachers included the setting up of a station in their school by university personnel from which to access the EEE and individualized training on utilizing the system from the computer in their school. In addition to this targeted group, three other student teachers were able to connect with the system. One was located in an elementary school in Des Moines, Iowa and the other two in Webster City, Iowa. All together, a total of thirty-five student teachers were able to connect with the system. However, three student teachers chose not to participate; thus, the number of people using the system was reduced to thirty-two student teachers.

In addition to the student teachers, six student teaching supervisors and nine faculty members from the university also received special support services for utilizing the EEE. These people were selected for participation based on their ability to access the system and their previous interest in computers. Four of the six supervisors were located in Ames, Iowa and utilized terminals on the Iowa State campus for connecting with the EEE. The other two supervisors lived in Des

Moines, Iowa and were loaned modems to use with their own computers at home. Eight of the nine faculty members utilized the terminals on campus for accessing the system while one was loaned a modem for use at home.

Instrumentation

A total of three surveys were administered during the semester. The student teachers completed an initial and a final survey. The ISU faculty and supervisors also completed a follow up survey. In addition, six of the supervisors and faculty members were interviewed to obtain further information.

The initial survey for the student teachers contained thirty-one multiple choice questions (see Appendix A). It was designed to collect information about the student teachers' computer experience, their attitude toward computers and their use in the classroom, their self-confidence in using a computer, and future plans for utilizing the computer in the classroom.

The final survey completed by the student teachers contained fifty-two multiple choice questions and three open ended questions (see Appendix B). It was divided into three sections. The first section involved specific reactions to the EEE. It was designed to collect information pertaining to the usefulness of the system, the educational issues discussed on the EEE, and the adequacy of the preparation received for using the system along with the quality of the experience. The three open ended questions were included in this section and

pertained to the continuation of the EEE, the most valuable feature of the system for the student teachers, and suggestions for future use of the EEE. The last two sections dealt with personal applications of the computer and educational applications of the computer respectively. These two sections contained the questions from the initial survey. They were included again to determine if any changes on the responses had occurred.

The ISU supervisors and faculty members also completed a follow up survey after their experience with the EEE (see Appendix C). It consisted of seven open ended questions dealing with the effectiveness of the system, the ability to gain useful information about student teachers' experiences from the EEE, and suggestions for modifications to improve the EEE as a communication tool. In addition to the surveys, personal interviews were conducted with two university supervisors, two elementary education faculty members, and two secondary education faculty members to obtain further information about their usage and suggestions for improving the system (see Appendix D). In an effort to obtain unbiased results in the interviews, the person who used the system the most and the person who used it the least out of each group were selected to be interviewed. There were four open ended interview questions. They pertained to the supervisors and faculty members' initial experiences with the EEE, the positive experiences they had with the system, the problems they encountered with it, and their suggestions for improving the EEE.

Procedure

EEE system

The EEE is an electronic bulletin board system that is designed to facilitate communication between student teachers and faculty at Iowa State University through telecommunications. A Macintosh SE with a 20 megabyte hard disk serves as the host computer for the system. All of the users call into the system over the telephone lines using a computer, a modem, and telecommunications software. A toll free number is provided by the university so the EEE users will not incur any long distance telephone fees. Once the users connect with the host computer, they can send and receive public or private messages. All of the messages are saved on the hard disk of the host computer where they may be accessed by the appropriate user(s). The software package Red Ryder Host is active on the host computer and manages the electronic bulletin board system.

Creating the EEE

The EEE was designed during the spring and summer semesters of 1988. In the remainder of this section, the process that was followed to create the EEE will be described.

Development of the EEE began in March of 1988. The software package Red Ryder Host was installed on the hard disk of the Macintosh SE host computer. Red Ryder Host can be described as a menu construction set that allows the system operator to uniquely

design the system. The package included the following five editors to be utilized in creating a system: the configuration editor, the message section editor, the menu editor, the userlog editor, and the file transfer section editor. All of the editors except the file transfer section editor were used in the development of the EEE. It was decided that a file transfer section would not be included initially on the EEE as the time necessary for uploading and downloading files would further tie up the one incoming phone line to the system. A description of the way the other four editors were set up for the EEE follows. It should also be noted at this point that a major goal throughout the development process was to make the EEE extremely easy to use and intuitive for novice computer users.

The configuration editor contained most of the information on how the EEE would look and operate. First, it allowed the system operator to control what information would be saved in the callerlog and where the records would be kept. The EEE callerlog was configured to record the number and type of messages sent and any errors that occurred within the system. The callerlog automatically recorded the name of the person calling and the times they logged on and logged off the system. The EEE callerlog was saved in a file on the hard disk of the host computer and was echoed to a printer continuously. Second, the EEE menus were configured to display the amount of time remaining for a user in the 30 minute time limit, list the valid selection keys for each menu, and display the users' calling statistics after logging on. Third, information about the modem on the host computer for the EEE

and security regulations were specified. Fourth, the procedure for displaying the system messages each time a user logged on and allowing them to cancel previously read system messages was defined. Finally, the protocol for handling users was established. This included information about valid passwords, clearance levels and time limits for new users, the ability of a new user to access the system, and where the userlog would be stored.

The message section editor was utilized to create the files that would contain the public and private messages on the EEE. The public and private messages were saved in separate "sections" of the files so they did not become interchanged. This editor was also utilized for various housekeeping activities such as backing up the message files, deleting inactive messages, and extracting the messages to a text file for examination.

The menu editor was used to create and link together the EEE menus. In order to create a menu, the title must be entered and each option must be defined. Defining an option involves entering the text that will be displayed on the users' screens that describes what the option does, identifying the key that the users must press to select the option, entering the code number that defines what operation the option will perform, entering the menu name or section number that the option will branch to, and setting the clearance level that determines which users the command will be displayed for.

The userlog editor was used to maintain the userlog. The userlog contains information about each user's password, time limit, clearance

level, terminal preferences, and calling statistics. The userlog editor was used to add new users to the system, edit information about current users, and delete inactive users from userlog.

Development of the EEE using the editors was completed by the middle of March 1988. The next step was to connect the host computer to a modem and get the system on-line. A special cable was necessary for this. A diagram illustrating the specifications for the cable is shown in Figure 1. Problems with this cable delayed the operation of the system until the middle of April 1988. During the remainder of the spring semester and throughout the summer semester, the EEE was tested by graduate students in the College of

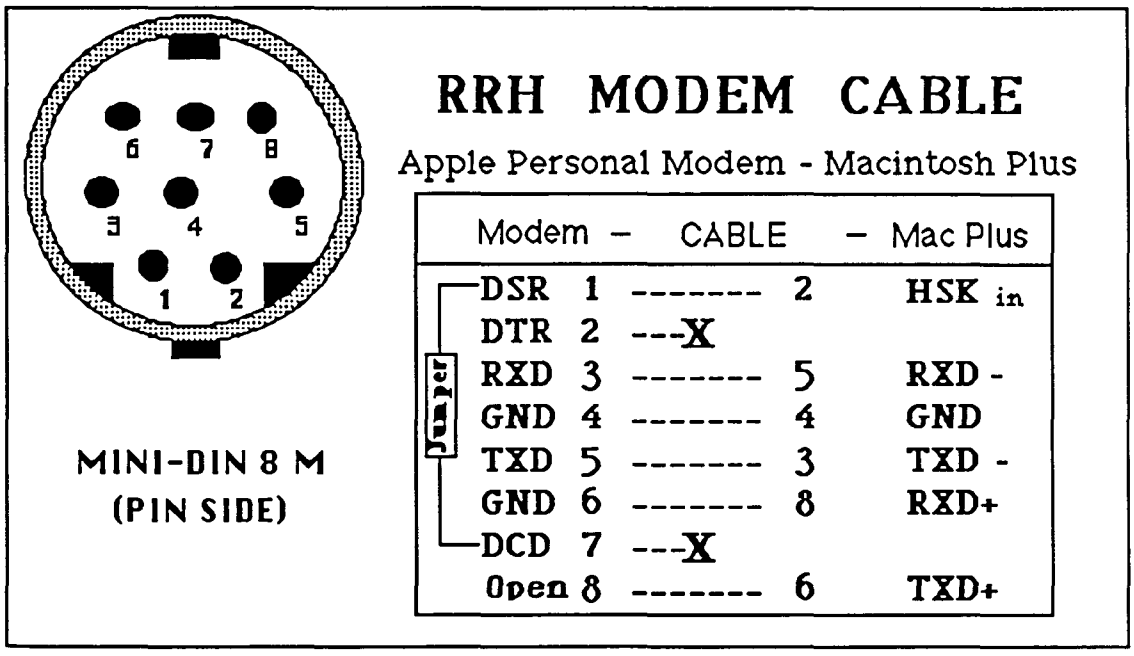

Figure 1. Diagram of cable specifications for the EEE host computer

Education who used it to communicate with other students and faculty in the college and a group of teachers who were participants in a federally funded project. These teachers lived in various locations around Iowa.

Description of the EEE

After several revisions, the EEE was ready for use by the student teachers for the fall semester of 1988. A description of the way the system was set up follows along with illustrations of some of the EEE menus.

Logging onto the EEE The users of the EEE could utilize almost any type of computer to connect with the system. The only requirement was that their modem and telecommunications software were compatible with their computer. Most participants utilized Apple IIe or GS computers. In addition to Apple computers, Macintosh and IBM computers were also used.

After connecting with the EEE, a brief welcome message was displayed and the users were prompted to log on by entering their name and password. After entering this information, the system would display their calling statistics and inform them if they had received any new mail since the last time they were on the system. Finally, the system messages would appear. These were messages that were posted by the system operator for all the users to see. The messages usually pertained to upcoming events or changes on the EEE that were important to know about.

Main menu After the system messages were displayed, the main menu for the EEE appeared on the screen as shown in Figure 2. A brief description of each command is listed below Figure 2.

```
=========IOWA STATE UNIVERSITY COLLEGE OF EDUCATION=========
=============ELECTRONIC EDUCATIONAL EXCHANGE===============
------------------------------------------------------------
<U>tilities Menu
<C>hange terminal preferences
<Y>ell at System Operator
<I>nformation and sign in for new users
<T>eachers' Mail Section
<N>ew User Introductions
<E>EE Conferences
<L>eave the EEE

<27 minutes left> Command <U,C,Y,I,T,B,S,G,N,E,L> ? _
```

Figure 2. Main menu of the EEE

Utilities menu Branched to a menu that enabled the users to change their passwords, view their calling statistics, display the welcome message, and obtain a list of all the users on the system.

Change terminal preferences Enabled the users to change their terminal preferences for linefeeds after a carriage return, the method of clearing the screen, and the utilization of hot menus. This was only necessary if they called in from a different computer and the information on the screen was unreadable.

Yell at system operator Alerted the sysop that a user wanted to chat. If the sysop was available, she could sign on the host computer and communicate directly with the caller or help them by selecting

menu options for them on the host computer so the caller could see how to navigate around the system.

Information and sign in for new users Provided information on becoming a validated user on the EEE.

Teachers' mail section Branched to the teachers' mail section where public and private messages were sent and received. This section was the most heavily used section.

New user introductions Branched to a section where new users "introduced" themselves. The introductions usually included the name of the student teacher, the grade level and school where they were student teaching, and their area of concentration. This option was added for use during the second half of the fall 1988 semester.

EEE conferences Branched to a menu where the topics of all the conferences were displayed. Each conference was a section where all of the messages were focused on a particular topic such as classroom management. This option was added for use during the second half of the fall 1988 semester.

Leave the EEE Allowed the users to log off the EEE.

Teachers' public mail In order to send and receive messages, the users would enter the mail section for teachers. At this point, a new menu would be displayed. This menu would allow the user to branch to the public or private mail sections for teachers. Each mail section will be described separately in the following paragraphs.

The public mail section contained messages that were posted for everyone on the system to read. An example of a public message is

shown in Figure 3. This is followed by an illustration of the public mail menu in Figure 4 and a brief description of each command.

```
Msg. #963 in **TEACHER PUBLIC MAIL** Posted on 10/28/88 at 13:26:24
To: ALL   From: MIKELL VANDE BERG
Subject: CHEMISTRY UNIT

I'M STUDENT TEACHING IN 6TH GRADE.  I'M DOING A UNIT ON CHEMISTRY AND I
NEED SOME INFORMATION ON HOW TO MAKE A 3D ATOM USING GUMDROPS, TOOTHPICKS,
ETC.  I CAN'T SEEM TO FIND INFORMATION ON THIS ANYWHERE.  IF YOU HAVE ANY
SUGGESTIONS AS TO WHERE I CAN FIND SOME HELP I WOULD APPRECIATE IT.
MIKELL VANDE BERG
D>elete, R>eply, N>ext (D,R,N)? _



Msg. #1074 in **TEACHER PUBLIC MAIL** Posted on 11/03/88 at 22:13:33
To: MIKELL VANDE BERG   From: JIM KUBICHEK
Subject: Reply To 'CHEMISTRY UNIT'

Try "Science Scope " Magazine, the middle school/junior high journal of
the National Science Teachers. I think I remember something in one of
their issues. Also try "Science and Children" the elementary journal of
the National Science Teachers Association... Good luck!
D>elete, R>eply, N>ext (D,R,N)? N
```

Figure 3. Example of public message on the EEE

```
------------------------------------------------------------
==================Teachers' Public Mail====================
------------------------------------------------------------
<P>ost a new public message
<S>can public messages
<D>elete a public message
<R>ead public messages
<F>ind a user's valid name for message addressing
<E>xit to Main Menu

(27 minutes left) Command (P,S,D,R,F,E) ? _
```

Figure 4. Public mail menu for teachers on the EEE

Post a new public message Enabled the user to add a new message to the public mail section.

Scan public messages Allowed the user to scan and sort all of the public messages with the option to read them.

Delete a public message Enabled the user to delete a public message by entering the message number.

Read public messages Allowed the user to read the messages in the public mail section.

Find a user's valid name for message addressing Enabled the user to search for another user's name by character in order to identify the correct spelling. The proper spelling is necessary for the system to locate the correct user and relay the message to him/her.

Introduction and conference sections The New User Introduction section and the EEE Conference section contained the same menus as the public mail section described above. However, the purpose for each section varied. Public mail contained messages of general interest to all users on the system while the new user introduction section facilitated the users in getting acquainted with each other and the EEE conference section focused the conversation on specific topics.

Teachers' private mail The private mail section contained messages that were sent from one user on the EEE to another. The following message is an example of a private message. The initial message was posted in the New User Introduction section. An ISU supervisor read the message and replied to the student teacher with a private message.

Msg. #824 in **INTRODUCTIONS** Posted on 10/21/88 at 13:22:19
To: ALL From: TINA MEYER
Subject: Introduction
Read it (Y or N)? Y
Hi! My name is Tina Meyer. I am currently student teaching at Meeker Elementary in Ames. I am in Teresa Braun's room, an MDE classroom. My area of concentration is Mental Disibilities. If anyone has information concerning Madeline Hunter I could sure use it. I would also appreciate any information concerning the integration of the Whole Language approach. Attention to my student teacher buddy! I do not know who you are or where you are. I hope to get in contact with you very soon. Thanks to anyone who can help me out!
D>elete, R>eply, N>ext (D,R,N)? _

Msg. #1067 in **PRIVATE MESSAGES** Posted on 11/03/88 at 15:27:06
To: TINA MEYER (Private) From: XXXXX
Subject: Madeline Hunter response
Hi, Thanks for using the system to get in touch with me, Tina. Madeline Hunter's work was originally for special education but has spilled over into regular education because it works so well. It is a system that insures all learners know the material necessary before they are assigned independent work. It works best when teaching one specific skill, such as math, science and phonetics. It is a simple process of getting the child's attention with something interesting, telling the child what they will be learning, modeling the specific task, asking the student what the objective is or what they will be learning, and then having the child show you that they understand by demonstrating the correct response to a problem, etc., then doing the work independently. The key is doing it correctly. The student's responses should be correct at this point. There is no reason to do something on paper that you don't understand and get it all wrong. The key to transfering this model to a large classroom of 28 children is making sure every child knows what to do. That is the key for the teacher. It comes in the step, check for understanding and quided practice, or tell me what you are learning, then show me that you know how to do it. Essentially, the goal is for the teacher to check and make sure that every child in the room can accurately do the skill before they start the independent work. This was easier in a special class when the teacher was working with 2 or 3 children. It is easy to reteach or use as many examples as necessary. It is more difficult with a large classroom. In this case you must devise a system to check the guided practice part of the lesson plan. You might assign 3 problems. Have everyone work them. Those that were correct go on to the independent assignment. Those that have trouble with the three, come to the reading table where you can work with them again, or reteach. Remembering then that these students probably shouldn't be assigned the full assignment. The key is that everyone in the class gets a perfect paper every day or close to it. Isn't that a wonderful goal. Other ways have been tried like having 5 students at a time do a problem on the board while others do it at their seats. You checking everyone. I hope this has been some help to you. If you can't understand my thought flow today or you need more assistance, please feel free to contact me again. I am willing to help.
D>elete, R>eply, N>ext (D,R,N)? _

Figure 5. Example of private message on the EEE

An illustration of the private mail menu is shown in Figure 6. This is followed by a brief description for each command.

```
------------------------------------------------------------
==================Teachers' Private Mail==================
------------------------------------------------------------
<R>ead private mail
<S>end private mail
<L>ook for all messages on the EEE addressed to you
<F>ind a user's valid name for message addressing
<E>xit to Main Menu

<27 minutes left> Command <R,S,L,F,E> ? _
```

Figure 6. Private mail menu for teachers on the EEE

Read private mail Allowed the user to read private messages that were written by him/her or addressed to him/her.

Send private mail Enabled the user to send a private message to another user on the EEE.

Look for all messages on the EEE addressed to you Allowed the user to search for all messages on the system addressed to him/her.

Find a user's valid name for message addressing Enabled the user to search for another user's name by character in order to identify the correct spelling. The proper spelling is necessary for the system to locate the correct user and relay the message to him/her.

Logging off the EEE When the users were ready to log off the EEE, they would choose the option to exit back to the main menu. From the main menu, they would select the Leave the EEE option. The system would verify that they want to logoff by asking if they were sure

they wanted to disconnect. The users would type Y for yes to complete the logging off process.

The following diagram was provided to help clarify the structure of the EEE menus.

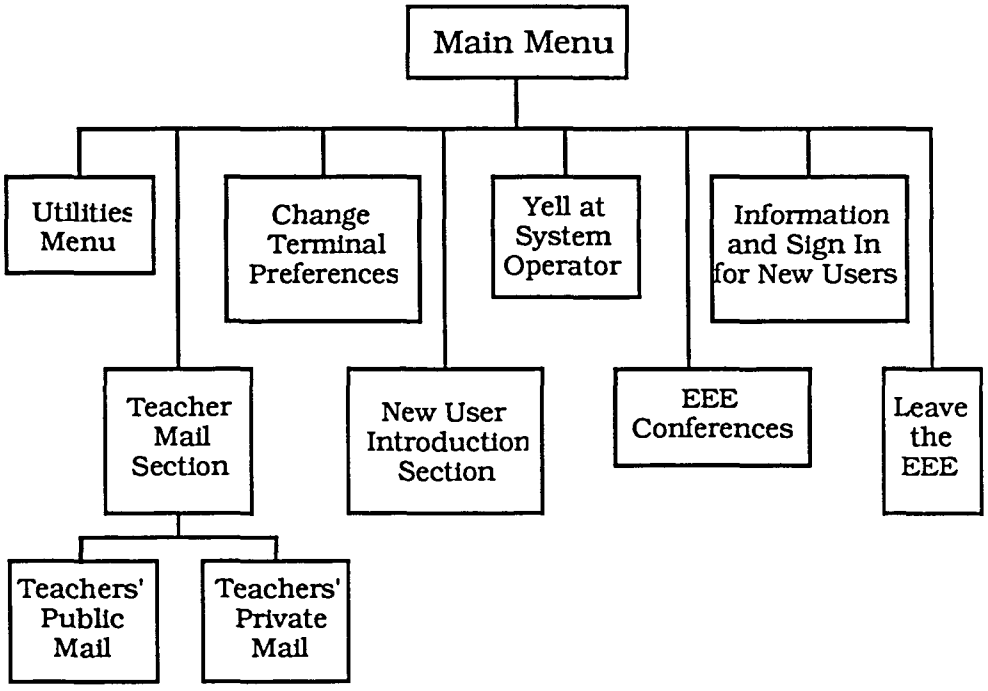

Figure 7. Diagram of EEE menu structure

Implementation of the EEE

In addition to setting up the system, materials for connecting with the EEE were also being prepared during the summer. Telecommunications software for various types of computers was being configured so it could be utilized to access the EEE. Directions were

also being written for utilizing the software and navigating around the EEE (see Appendix E).

Hardware assessment of schools In order to determine which elementary schools would be involved in the fall project, a list of student teachers and their assigned schools was obtained from the College of Education at Iowa State. On August 2, 1988, a letter describing the project and a questionnaire were sent to all 47 elementary schools that were assigned a student teacher (see Appendix F). The questionnaire was necessary to determine the amount of hardware that would be available in the schools to support the project. Each school was asked to indicate if they had a computer, a modem, telecommunications software, and an available telephone line for use after school hours that the student teachers could use to connect with the EEE. A blank for the type of equipment that was available was also included to aid in finding any necessary additional hardware that was compatible with the existing equipment in the schools.

Selection of target schools Because of the large number of schools and student teachers that were involved, it was decided that certain schools would be targeted to receive special support services. This would ensure that the student teachers at these schools were able to utilize the system. There were two criteria for selecting the target schools. First, the amount of equipment available in the school to support the project was considered. This information was collected on the hardware survey that was sent to each elementary school that was assigned a student teacher. The second consideration was the ability of

the university supervisor assigned to the school to access the system frequently and conveniently to communicate with the student teachers. This requirement included the supervisors who had a computer at home or were on campus two to three times a week so they could utilize the terminals located on campus. As previously mentioned, the special support services included the setting up of a station in their school by university personnel from which to access the EEE and individualized training on utilizing the system from the computer in their school. The individualized training involved helping the student teachers log on to the EEE for the first time, demonstrating how to send and receive public and private mail, and logging off the system.

ISU faculty and supervisor preparation It was also necessary to obtain a list of the university student teaching supervisors and the respective schools to which they had been assigned. On August 19, 1988, a meeting was held with the supervisors. The purpose of the meeting was to introduce the system and demonstrate how utilize it. The supervisors were also asked to indicate on paper if they had a computer at home or would be on campus one or two times a week to access the EEE from the terminals located on campus.

During the month of September, two terminals were set up on the Iowa State campus to be utilized by the ISU faculty and supervisors for connecting with the EEE. One terminal was located in the main office of the Secondary Education Department in Lagomarcino Hall. The other terminal was located in an office in the Elementary Education Department in the same building. These locations were chosen as they

provided accessibility to a number of people with a limited number of terminals. Specific directions for calling the EEE along with information about sending and receiving messages were placed by each terminal (see Appendix E).

Individualized training for Iowa State faculty and supervisors was also taking place at this time. The training involved assisting the participants in connecting with the EEE for the first time, demonstrating how to send and receive public and private mail, and logging off the system. A form to request an individualized training session was sent to all of the faculty and supervisors in the department (see Appendix G). All of the supervisors and faculty members who participated in the project received this training.

Student teacher preparation On August 23rd, a group training session for the student teachers was provided on campus before they began teaching in their assigned schools. This session involved an introduction to the system and a demonstration on how to utilize the EEE. Directions for utilizing the system were also passed out (see Appendix E). In addition, the student teachers completed the initial survey dealing with their background in computers (see Appendix A).

At midterm, the student teachers attended another group training session on campus before going to their new teaching assignments for the remainder of the semester. Once again, a demonstration on how to utilize the EEE was given and written directions were provided. However, the main purpose of this meeting was to get the student teachers excited about the possibilities of communicating over the EEE.

For this reason, several procedures were described and implemented to encourage the student teachers to utilize the system during the remainder of the semester. These will be described in detail in the following section. At the end of the meeting, the remainder of the initial surveys were completed.

Techniques to encourage use As the first half of the semester passed, it became clear that it was going to take a concentrated effort to get people started using the EEE. Very few of the student teachers had taken advantage of the opportunity to communicate with other student teachers, their supervisors, or the ISU faculty over the system. In order to encourage people to get into the habit of using this new technology, it was decided that the participants needed more of a purpose to access the EEE.

Before the second half of the semester began, the researcher went out to each of the target schools. The purpose of the visits was to be sure all the hardware was in place for connecting with the EEE and to be sure it was working properly.

The College of Education had also purchased five modems to be loaned out to supervisors and ISU faculty in order to make it more convenient for them to access the EEE. The modems were checked out to the people and installed for use during the remainder of the semester.

As previously mentioned, the main purpose of the midterm meeting was to get the student teachers excited about the possibilities of communicating over the EEE. Since participation was still voluntary,

the following procedures were implemented in order to encourage the student teachers to utilize the system.

First, most of the student teaching supervisors were now trained on using the system and had access to it. Since frequent communication between student teachers and their supervisors is beneficial, it was hoped that the EEE would provide a more convenient communication method, thus ensuring regular use.

Second, the student teachers were paired up with an Iowa State faculty member and another student teacher with whom they were to communicate over the EEE. The faculty members were to act as mentors for their student teachers by offering them advice and suggestions on such topics as classroom management, lesson planning, instructional materials, and classroom activities. The criteria for pairing up the student teachers with each other was the grade level at which they were teaching and their areas of concentration. The similar interests shared by the partners was hoped to encourage them to use the system.

Next, a new section was added to the EEE where new users could "introduce" themselves. By describing personal interests, areas of expertise, and teaching levels, users could become acquainted with each other and know who to contact for certain questions.

Finally, an additional section was added where "conferences" relating to certain issues in education were held. Each week a different topic or subject area was added. All conference topics were continued for a three week period in order to provide adequate time for everyone to

respond to the issue. Conference topics included: classroom management; reading, language arts, and social studies; math, science, and computers; and resumes and job opportunities. Items were posted by the system operator and faculty members as well as the student teachers for everyone to respond to.

In order to implement the above ideas, the following steps were taken at the midterm meeting with the student teachers. First, a schedule of all of the EEE conferences for the remainder of the semester was passed out (see Appendix E). In addition, the students were asked to fill out a form concerning the name they wanted to be entered in the system's userlog, a password, the school and grade level they were student teaching at, and their area of concentration (see Appendix H). The names and passwords for each student teacher were necessary to obtain so they could be entered into the system prior to the first time they attempted to log on in order to make the process easier for them. The remainder of the information was used to pair up the student teachers with similar interests as partners.

On the following day, the names and passwords for the student teachers were entered into the EEE userlog. In addition, a message was sent to each student teacher informing them who their faculty member and student teaching partner were. These messages were waiting for them to receive the first time they logged on. During the first week after the midterm meeting, the callerlog was closely monitored to determine which student teachers at the targeted schools may be having trouble accessing the system. During the next week, the

researcher visited each of the target schools to help the remainder of the student teachers log on for the first time.

Evaluation of the EEE

The data used in the evaluation of the EEE was collected from several sources. These sources include the student teacher surveys, the faculty and supervisor survey, the interviews with the faculty and supervisors, the EEE callerlog, and the EEE message files.

Since the student teachers were asked to complete surveys pertaining to their experience with the EEE, the Human Subjects Committee at Iowa State University was consulted for approval of the instruments. Permission to administer the surveys was granted on August 18, 1988 (see Appendix J).

As previously mentioned, the student teachers completed the initial survey at the group training session in August. This survey was designed to collect information on the student teachers' computer experience, their attitude toward computers and their use in the classroom, their self-confidence in using a computer, and future plans for utilizing the computer in their classroom (see Appendix A). Several questions corresponding to each of the above categories were formulated by the researcher and included on the survey. The reliability was figured and reported for the following categories.

Table 1. Reliability calculations for the initial survey for student teachers on the EEE

Category	Reliability
Attitude toward personal computer applications	.8768
Attitude toward educational computer applications	.7294
Plans for utilizing computers in the classroom	.8755
Self-confidence in using a computer	.8806

Throughout the semester, records were kept of the callerlog for later analysis. This information included the name and time of the person calling, the number of messages they sent, and the amount of time for the call. Red Ryder Host Utilities was used to analyze the callerlog. This program calculated general calling statistics for the EEE. In addition, the files containing the messages were also printed out twice a week. The system operator was the only person who had access to the print outs. The purpose for this was to identify any messages that were not being answered within two or three days. In this case, notices were sent on paper to the person asking them to log on to receive their message (see Appendix I). The message files were also analyzed to determine the type of interactions that took place on the system. This involved examining the subject headings in the EEE message files and identifying categories for various types of interactions. A total for each type of interaction was then calculated.

During the first week of December, the final surveys for the student teachers were delivered to the schools (see Appendix B). In addition to

the questions pertaining to the personal and educational applications of the computer from the initial survey, the final survey was designed to collect information pertaining to the usefulness of the system, the educational issues discussed on the EEE, and the adequacy of the preparation received for using the system. A section corresponding to each of the above categories was included on the survey. The reliability was figured and reported for the following categories as shown in Table 2. . The researcher met with the student teachers at each school and explained that the survey results were to be used to improve and expand the current system. Arrangements were then made for the researcher to return to the school to pick up the surveys in a couple of days.

Table 2. Reliability calculations for the final survey for student teachers on the EEE

Category	Reliability
Attitude toward personal computer applications	.9510
Attitude toward educational computer applications	.8151
Plans for utilizing computers in the classroom	.8814
Self-confidence in using a computer	.9025

The final surveys for the university supervisors and faculty members were dispersed and collected during January of 1989. This survey consisted of seven open ended questions pertaining to the effectiveness of the system, the ability to gain useful information about student

teachers' experiences from the EEE, and suggestions for improving the EEE as a communication tool (see Appendix C).

During this time, the interviews with selected supervisors and faculty members were also being scheduled. As previously mentioned, the supervisor, elementary education faculty member, and secondary education faculty member who used the system the most and the one who used it the least were interviewed in an effort to obtain unbiased results. This resulted in a total of six interviews with two members of each group being represented. The four interview questions pertained to the initial experiences of the supervisors and faculty members with the EEE, the positive experiences they had with the system, the problems they encountered with it, and their suggestions for improving the current system (see Appendix D).

Data Analysis

In order to answer the research questions, descriptive statistics were calculated from the data on the surveys, the interviews with the faculty and supervisors, the EEE callerlog, and the EEE message files. These statistics included frequency counts and means for the data on each question. In addition to these statistics, a regression analysis was used to determine if previous computer experience had any effect on usage of the EEE and T tests were utilized to determine if student teachers were more likely to utilize other computer activities in their future classrooms because of their EEE experience and if any changes in attitude toward computers had occurred during the semester. The

purpose for addressing these questions was to gain information on the usage of the EEE and to determine the value of the system as a communication tool for educators.

Summary

The purpose of this study was to examine the usage and value of electronic networks as support systems for beginning teachers. In this study, information was collected on the use and value of the Electronic Educational Exchange as a communication tool for Iowa State student teachers, supervisors, and faculty members. The chapter began with a description of the sample involved in the study and the instruments that were utilized to collect the data. Next, the procedures that were followed to set up the system, implement it, and evaluate it were presented. Example messages from the EEE, illustrations of the EEE menus, and a diagram of the menu structure were included in this section. The chapter concluded with a discussion on the plans for data analysis.

CHAPTER IV. RESULTS

In order to answer the research questions, statistics were calculated from the data on the surveys, the personal interviews, the EEE callerlog, and the EEE message files. A total of three surveys were administered during the semester. The student teachers completed an initial and a final survey pertaining to their computer background and their experience with the EEE. The ISU faculty and supervisors also completed a follow up survey concerning their experience with the EEE. In addition to the faculty survey, six of the supervisors and faculty members were interviewed to obtain further information on the system. The EEE callerlog was saved and analyzed using the program Red Ryder Host Utilities. This program calculates general calling statistics for the system. Finally, the messages were printed out and examined to determine the type of interactions that took place on the EEE. The research questions are listed below along with the source of the data and the statistics that were computed.

User Characteristics:

1. What are the characteristics of the people who use the EEE?

Demographic information pertaining to the student teachers' gender, age, grade point average, and area of concentration was collected on the initial survey. A frequency count and the percentage were calculated for each item. The results are shown in Table 3.

As reported in Table 3, 92.9% of the EEE users were female and 82.1% of the users were between the ages of 20 and 25. This is not

Table 3. User characteristics for the EEE

Characteristic	N	Frequency	Percentage
Gender	28		
Male		2	7.1%
Female		26	92.9%
Age	28		
20-25		23	82.1%
26-30		2	7.1%
31-35		0	0.0%
36-40		3	10.7%
41 and over		0	0.0%
GPA	28		
3.5-4.0		8	28.6%
3.0-3.49		13	46.4%
2.5-2.99		7	25.0%
2.0-2.49		0	0.0%
Area of Concentration	26		
Reading		6	23.1%
Math		2	7.7%
Educ. Computing		1	3.8%
Other		17	65.4%

surprising when considering the typical elementary education student teacher. Almost half (46.4%) of the student teachers using the EEE had a cumulative GPA between 3.00 and 3.49 out of a 4.00 scale. Most of the student teachers on the EEE did not have an area of concentration in educational computing or a related field such as mathematics. The largest percentage (65.4%) of the student teachers on the EEE fell into the "other" category for area of concentration. This category included child development, classroom dynamics, coaching, culturally different children, environmental education, exceptional children, mainstreaming, mental disabilities, physical education, rural education, speech, and most subject areas except mathematics as possibilities for an area of concentration.

Usage:

2. How often does the average user call the EEE? Do student teachers with previous computer experience utilize the EEE more often than student teachers without previous computer experience?

An analysis of the EEE callerlog was completed using Red Ryder Host Utilities. A mean for the average number of calls per user was reported. Other user statistics were also calculated based on the information contained in the callerlog. The information is presented in Table 4.

An analysis of the EEE callerlog revealed that the average user called the EEE 7.93 times over the eight week period from October 18, 1988 to December 14, 1988. The average length of each call was nine minutes. During this eight week period, the total connect time for the

Table 4. EEE Usage for ISU student teachers, faculty, and supervisors from 10/18/88 to 12/14/88

Total Connect Time	72 hours 49 minutes
Total Number of Logins	460
Total Number of Users	58
Average Connect Time per Login	9 minutes
Average Number of Logins per User	7.93
Number of Private Messages	407
Number of Public Messages	53

fifty-eight users of the EEE was 72 hours and 49 minutes with a total of 460 calls. The total number of messages generated was 407 private messages and 53 public messages. These calculations included the student teachers, their supervisors, and the ISU faculty as the users of the EEE.

In addition, data pertaining to the amount of the student teachers' previous computer experience was collected on the initial survey. A measure of computer experience was computed for each student teacher based on their responses on the survey. Regression analysis showed no relationship between the number of calls a student teacher made and her measure of computer experience.

Interactions:

3. What type of interactions take place on the EEE?

Once a week, the message files were printed out and saved for later analysis by the system operator. However, not all of the messages were included in the analysis as users deleted messages after they had read them during the week. The subject headings in the EEE message files were examined and categories for various types of interactions were identified. A total for each type of interaction was then calculated. The results are shown in Table 5.

The most common type of interaction on the EEE was the sharing of student teaching experiences among student teachers. These interactions often included a discussion of the progress the student teachers had made toward completing the required unit and bulletin

Table 5. Analysis of EEE message topics

Category	# of Messages
sharing of student teaching experiences with other student teachers	54
notification of student teaching and faculty partners - system operator	48
communication between student teachers and ISU faculty	39
communication between student teachers and their supervisors	20
communication between student teaching partners	20
new user introductions	12
communication between ISU faculty members	11
request for teaching ideas or activities for a particular subject	8
EEE conferences	6
request for information on teaching strategies	4
public announcements about events at ISU	4
communication between student teachers and their faculty partners	2

boards for student teaching and common problems the student teachers were encountering.

In addition, the final survey asked the student teachers to indicate the extent to which they utilized the EEE to communicate with others about resource materials and people, teaching strategies and ideas, classroom management techniques, discipline techniques, and scheduling times for observations with their supervisors. Frequencies and means were calculated for each item.

Table 6 indicates that most of the student teachers felt that they did not discuss the topics listed in their interactions on the EEE. An alternate analysis included only those student teachers who called the EEE more than three times. The rationale for this process was based on the idea that people could not have discussed the above topics on the EEE if they had rarely used the system. The new calculations are shown in Table 7.

The second analysis indicates that the student teachers discussed teaching strategies and ideas the most out of the topics listed in their interactions on the system. The calculations also indicate that resource materials and people and classroom management techniques were the topics of discussion for a fewer number of people and that discipline techniques and scheduling observations with supervisors were generally not topics of interactions on the EEE.

Preparation:

4. Was the preparation the student teachers received for utilizing the EEE adequate?

Table 6. Topics of interaction for all ISU student teachers, faculty, and supervisors on the EEE

Category	N	Resp.	Freq.	%	Mean	S.D.
Resource Materials & People	28	1	2	7.1	3.43	1.40
		2	8	28.6		
		3	3	10.7		
		4	6	21.4		
		5	9	32.1		
Teaching Strategies & Ideas	28	1	2	7.1	3.18	1.33
		2	9	32.1		
		3	6	21.4		
		4	4	14.3		
		5	7	25.0		
Classroom Management Techniques	28	1	3	10.7	3.50	1.37
		2	4	14.3		
		3	6	21.4		
		4	6	21.4		
		5	9	32.1		
Discipline Techniques	28	1	3	10.7	3.50	1.37
		2	4	14.3		
		3	6	21.4		
		4	6	21.4		
		5	9	32.1		
Scheduling Observation Times with Supervisor	28	1	2	7.1	3.86	1.43
		2	5	17.9		
		3	3	10.7		
		4	3	10.7		
		5	15	53.6		

1 = Strongly Agree
2 = Agree
3 = Undecided
4 = Disagree
5 = Strongly Disagree

Table 7. Topics of interaction for ISU student teachers, faculty, and supervisors who accessed the EEE more than three times

Category	N	Resp.	Freq.	%	Mean	S.D.
Resource Materials & People	15	1	1	6.7	2.93	1.33
		2	7	46.7		
		3	2	13.3		
		4	2	13.3		
		5	3	20.0		
Teaching Strategies & Ideas	15	1	1	6.7	2.53	0.99
		2	8	53.3		
		3	4	26.7		
		4	1	6.7		
		5	1	6.7		
Classroom Management Techniques	15	1	2	13.3	2.93	1.28
		2	4	26.7		
		3	4	26.7		
		4	3	20.0		
		5	2	13.3		
Discipline Techniques	15	1	2	13.3	3.00	1.25
		2	3	20.0		
		3	5	33.3		
		4	3	20.0		
		5	2	13.3		
Scheduling Observation Times with Supervisor	15	1	2	13.3	3.53	1.60
		2	3	20.0		
		3	2	13.3		
		4	1	6.7		
		5	7	46.7		

1 = Strongly Agree
2 = Agree
3 = Undecided
4 = Disagree
5 = Strongly Disagree

The student teachers who utilized the EEE were asked to evaluate the adequacy of the preparation they received for using the system along with the quality of their experience on the final survey. The questions that were included in this section are listed in Table 8 along with the frequencies, percentages, means and standard deviations.

Overall, the student teachers indicated that they were satisfied with the preparation they had received for utilizing the EEE. They also expressed that they found the system to be easy to use and felt the directions for the EEE were clearly written. In addition, the student teachers indicated that they didn't have difficulty with the computer in their school when they used it to call the EEE and that the questions they asked on the system were answered promptly. The biggest problem in this area was the difficulty in connecting with the EEE because the phone line was busy.

Computer Attitude:

5. Did the student teachers' experience with the EEE influence their attitude toward personal or educational applications of the computer? Are student teachers more likely to utilize other computer activities in their classrooms in the future because of their experience with the EEE?

The initial and final surveys collected information on the student teachers' attitudes toward personal and educational applications of the computer and their plans for classroom applications of the computer. A T-test was utilized to determine if the difference between the means

Table 8. Student teacher preparation for using the EEE

Question	N	Resp.	Freq.	%	Mean	S.D.
I received adequate training for utilizing the EEE.	28	1	13	46.4	1.86	1.15
		2	11	39.3		
		3	1	3.6		
		4	1	3.6		
		5	2	7.1		
I had difficulty with the computer in my school when I used it to call the EEE.	28	1	6	21.4	3.39	1.62
		2	4	14.3		
		3	1	3.6		
		4	7	25.0		
		5	10	35.7		
I had difficulty connecting with the EEE because the phone line was busy.	28	1	9	32.1	2.39	1.37
		2	9	32.1		
		3	3	10.7		
		4	4	14.3		
		5	3	10.7		
I found the EEE system to be easy to use.	28	1	13	46.4	1.96	1.20
		2	8	28.6		
		3	4	14.3		
		4	1	3.6		
		5	2	7.1		
I felt the directions for the EEE were unclear.	28	2	2	7.1	4.10	0.92
		3	4	14.3		
		4	11	39.3		
		5	11	39.3		
The questions that I asked on the EEE were answered promptly.	28	1	6	21.4	2.32	1.02
		2	11	39.3		
		3	8	28.6		
		4	2	7.1		
		5	1	3.6		
I received adequate preparation for utilizing the EEE.	28	1	13	46.4	1.86	1.15
		2	11	39.3		
		3	1	3.6		
		4	1	3.6		
		5	2	7.1		

1 = Strongly Agree
2 = Agree
3 = Undecided
4 = Disagree
5 = Strongly Disagree

for each question was significant. The results are summarized in the Tables 9, 10, and 11.

The questions marked with asterisks are the ones that had significant results at the .05 level. However, since there was no control group, it can not be determined if the changes were related to the student teachers' experiences with the EEE. Further analysis was conducted to see if student teachers who called the system more had a greater change in responses. However, a regression analysis showed no significant relationship between the amount of change and the number of times a student teacher called the EEE.

A question concerning the influence of the EEE on future applications of telecommunications in teaching was also included on the final survey. It was found that 42.9% of the student teachers felt that their experience with the EEE had encouraged them to use telecommunications in their classrooms. The results are shown in Table 12.

Usefulness:

6. Do student teachers believe that the EEE is a useful tool for communicating with their peers, university supervisors, and ISU faculty?

The final survey included questions pertaining to the usefulness of the EEE for communicating with other student teachers, supervisors, and faculty members. The frequency and mean were calculated for each item. This information is presented in Tables 13 and 14.

Table 9. Student teachers' attitudes toward personal computer applications

Question	N	Mean Diff.	S.D.	P
I feel that computers make my school work easier.	26	-0.12	0.91	.5233
I see the computer as a useful tool for my personal work.	27	-0.26	0.76	.0897
I feel that computers make my school work more enjoyable.	27	-0.37	0.88	.0386*
The computer is useful for accessing and organizing information.	27	0.00	0.91	1.0000
Word processing makes writing more enjoyable.	27	0.11	0.85	.5017
Total	27	-0.13	0.68	.3305

*Significant at .05 level.

Table 10. Student teachers' attitudes toward educational computer applications

Question	N	Mean Diff.	S.D.	P
Computers can help people learn to think more effectively.	27	-0.15	0.95	.4246
Teachers should know how to use a computer.	27	0.07	0.83	.6462
The computer should be integrated into the curriculum.	27	-0.22	0.89	.2067
Total	27	-0.10	0.79	.5239

Table 11. Plans for classroom applications of computers

Question	N	Mean Diff.	S.D.	P
I plan to use the computer in my teaching.	27	-0.44	0.97	.0254*
I plan to keep my grades for my students on a spreadsheet.	27	-0.30	1.14	.1875
I plan to use the computer in my classroom with:				
drill & practice programs	27	-0.55	0.89	.0033*
tutorials	27	-0.70	0.67	.0001*
word processor, spreadsheet, and data base programs	26	-0.23	0.86	.1848
telecommunications	26	-0.12	0.99	.5589
simulations and problem solving software	26	-0.54	0.76	.0014*
Overall, I feel the computer is a very important tool for my teaching.	22	-0.27	0.63	.0555
Total	27	-0.38	0.55	.0013*

*Significant at .05 level.

Table 12. Effect of EEE on future telecommunications applications

Question	N	Resp.	Freq.	%	Mean	S.D.
My experience with the EEE has encouraged me to use telecommunications in my teaching.	28	1	7	25.0	2.86	1.46
		2	5	17.9		
		3	6	21.4		
		4	5	17.9		
		5	5	17.9		

Table 13. Usefulness of the EEE for all ISU student teachers on the system

Question	N	Resp.	Freq.	%	Mean	S.D.
1. The EEE facilitated my communication with ISU faculty during my student teaching experience.	28	1	5	17.9	3.00	1.36
		2	6	21.4		
		3	5	17.9		
		4	8	28.6		
		5	4	14.3		
2. The EEE facilitated my communication with my supervisor during my student teaching experience.	28	1	3	10.7	3.71	1.30
		2	2	7.1		
		3	4	14.3		
		4	10	35.7		
		5	9	32.1		
3. The EEE facilitated my communication with my peers during my student teaching experience.	28	1	7	25.0	2.46	1.20
		2	9	32.1		
		3	5	17.9		
		4	6	21.4		
		5	1	3.6		
4. I benefitted from the increased interaction with my peers on the EEE during my student teaching experience.	28	1	5	17.9	3.11	1.40
		2	5	17.9		
		3	5	17.9		
		4	8	28.6		
		5	5	17.9		
5. The EEE helped me to feel less isolated from my peers during my student teaching experience.	28	1	6	21.4	2.85	1.38
		2	6	21.4		
		3	6	21.4		
		4	6	21.4		
		5	4	14.3		
6. The EEE helped me to feel less isolated from ISU faculty during my student teaching experience.	28	1	2	7.1	3.25	1.11
		2	4	14.3		
		3	11	39.3		
		4	7	25.0		
		5	4	14.3		
7. The ability to receive suggestions and help from other educators on the EEE reduced my anxiety about student teaching.	28	1	2	7.1	3.18	1.19
		2	6	21.4		
		3	10	35.7		
		4	5	17.9		
		5	5	17.9		

Table 13. continued

Question	N	Resp.	Freq.	%	Mean	S.D.
8. I feel my student teaching experience was enriched as I could communicate with experts in the field of education on the EEE.	28	1	2	7.1	3.07	1.18
		2	8	28.6		
		3	8	28.6		
		4	6	21.4		
		5	4	14.3		
24. The EEE was a useful system for me.	28	1	4	14.3	3.11	1.50
		2	9	32.1		
		3	3	10.7		
		4	4	14.3		
		5	8	28.6		

1 = Strongly Agree
2 = Agree
3 = Undecided
4 = Disagree
5 = Strongly Disagree

Table 14. Usefulness of the EEE for communication between student teachers and with ISU faculty and supervisors.

Question	N	Frequency	Percentage
The most useful aspect of the EEE was the ability to communicate with my	27		
peers		23	85.2%
supervisor		4	14.8%
ISU faculty		0	0.0%
The least useful aspect of the EEE was the ability to communicate with my	27		
peers		3	11.1%
supervisor		15	55.6%
ISU faculty		9	33.3%

Overall, it appears that the student teachers who used the EEE found it most useful for communicating with their peers and least useful for communicating with their supervisors. They also indicated that the EEE facilitated their communication with their peers and helped them to feel less isolated from their peers during their student teaching experience. The student teachers expressed that the EEE did not facilitate their communication with their supervisor during their student teaching experience. The student teachers seemed to be split into groups on the remainder of the questions with about as many people agreeing with each question as there were disagreeing with it. Further analysis was used to determine if the student teachers who called the system more also found it more useful. First, the student teachers were divided into two groups based on the number of times they called the EEE. The first group included those who called the system more than three times and the second group contained those who called the system three times or less during the semester. Then, a T-test was utilized to determine if there was any difference between the means for the two groups on each question. The results are shown in Table 15.

As Table 15 indicates, all of the P values are significant at the .05 level. This shows that the mean responses for the above questions were significantly lower for the group who called the EEE more than three times. In addition, note that all of the means for the first group (except question 2) were less than three (agreed), while those for group two were greater than three (disagreed). These results indicate

Table 15. Usefulness of the EEE for ISU student teachers who accessed the system more than three times

	Calls > 3			Calls < or = 3				
Ques. #	N	Mean	S.D.	N	Mean	S.D.	Mean Diff.	P
1	15	2.40	1.30	13	3.69	1.11	-1.29	.0093*
2	15	3.20	1.37	13	4.31	0.95	-1.11	.0216*
3	15	1.93	0.96	13	3.08	1.19	-1.15	.0092*
4	15	2.40	1.12	13	3.92	1.26	-1.52	.0022*
5	15	2.20	1.21	13	3.61	1.19	-1.41	.0045*
6	15	2.80	1.08	13	3.77	0.93	-0.97	.0181*
7	15	2.73	1.10	13	3.69	1.11	-0.96	.0303*
8	15	2.60	1.06	13	3.62	1.12	-1.02	.0205*
24	15	2.27	1.22	13	4.08	1.19	-1.81	.0005*

*Significant at .05 level.

that the student teachers who utilized the EEE regularly found it to be useful. Likewise, those who used the system very little felt that it was not useful.

Faculty Reactions:

7. Do the ISU faculty believe they are gaining useful information about the student teachers' experiences in the field from the EEE?

The ISU faculty and supervisors were asked to complete a follow up survey on their experience with the EEE. Two of the questions pertained to gaining useful information about student teachers' experiences from the EEE. The questions are shown in Table 16 along with the frequencies and percentages for each question.

As Table 16 indicates, most of the faculty and supervisors (83.3%) felt that the EEE is or could be a useful tool for learning about problems encountered by student teachers in the field. In addition, one of the faculty members indicated she was interested in documenting the frequency of particular problems in order to identify the most common ones. Another interesting suggestion was to require the student teachers to enter their daily logs and lesson plans so they could be more closely monitored in order to identify problems and receive feedback more quickly.

Modifications:

8. How should the EEE be modified to better serve the needs of new teachers and university faculty and supervisors as an effective communication tool?

Table 16. Faculty reactions to the EEE

Question	N	Resp.	Freq.	%
Do you believe that the EEE is or could be a useful tool for learning about problems encountered by student teachers in the field?	11	Yes	11	83.3
		No	1	8.3
Do you believe that the information you acquire from the EEE about student teachers' experiences would be useful for identifying and alleviating problems or weaknesses in the university curriculum for teacher education students?	11	Yes	5	41.7
		No	1	8.3
		?	5	41.7

Questions pertaining to the continuation of the EEE, the advantages and disadvantages of the system, and suggestions for future modifications of the EEE were included on the the student teachers' final survey and the faculty and supervisors' final survey and interview. The opinions expressed by the student teachers will be described first followed by those of the faculty and supervisors.

Most of the student teachers (84%) indicated that they thought the EEE should be continued. Three people out of the twenty-five who responded thought it should not be continued and one person was undecided. The student teachers were also asked if they would be interested in using the EEE during their first year of teaching. The results in Table 17 show that 60.7% of the student teachers would be interested in using the EEE during their first year of teaching, while 21.4% were undecided and 17.8% would not be interested in using the system.

The student teachers were also asked to offer suggestions for future modifications to the EEE. The most frequent suggestion was to get more phone lines coming into the host system to handle all of the callers. The second most popular response was to introduce the student teachers to the EEE earlier in their college career so they were more familiar with it by the time they were student teaching. The reasoning behind this seemed to be that they were very busy during student teaching and would appreciate the system more if they were already comfortable with it.

Table 17. Interest in EEE during first year of teaching

Question	N	Resp.	Freq.	%	Mean	S.D.
I would be interested in using the EEE during my first year of teaching.	28	1	10	35.7	2.32	1.33
		2	7	25.0		
		3	6	21.4		
		4	2	7.1		
		5	3	10.7		

1 = Strongly Agree
2 = Agree
3 = Undecided
4 = Disagree
5 = Strongly Disagree

The faculty and supervisors were also asked if they felt the EEE should be continued. Most of them (75%) felt that the system should be continued. One person indicated that he felt it would be particularly useful for secondary education student teachers and first year teachers who were more isolated from their peers than elementary education student teachers.

When asked about the advantages of the EEE, the most common response was the improved communication between student teachers in the field and university personnel. The faculty and supervisors also felt that the system demonstrated an excellent application of telecommunications to the student teachers and helped them to learn how to use the technology. The faculty and supervisors indicated that the greatest disadvantages of the EEE were the shortage of terminals to connect with the system and the limitation of only having one phone for incoming calls on the host computer. When asked for their suggestions for improving the EEE, the faculty and supervisors indicated that their main concern was the need for more hardware in the schools and at the university to support the project.

Summary

In order to answer the research questions, statistics were calculated from the data on the surveys, the personal interviews, the EEE callerlog, and the EEE message files. The research questions included the following topics: user characteristics for the EEE, usage of the system, interactions on the EEE, preparation for using the system,

computer attitudes of the student teachers, the value of the system as viewed by the student teachers, the faculty's reactions to the EEE, and necessary modifications to the system. The source of the data and the statistics that were computed were presented for each research question.

CHAPTER V. CONCLUSIONS

This chapter begins with a summary of the information presented in the previous chapters. The summary is followed by a discussion of the results for this study. Next, suggestions for developing and implementing a network based on the experiences of this study are presented. The chapter concludes with recommendations for further research on electronic communication networks for educators.

Summary of Previous Chapters

A major concern within the field of education continues to be the professional isolation of teachers. This problem can be especially acute for beginning educators as they face many challenges during their first year of teaching. With the contact from the teacher training institution broken and the barrier that exists between beginning and experienced educators, many new teachers are forced to face the initial challenges of teaching alone. Unfortunately, these early experiences can have a strong impact on a teacher's career. Thus, a more supportive environment for beginning teachers along with a gradual induction into the responsibilities of teaching have been recommended.

A recent solution to the problem of teacher isolation involves the establishment of electronic communication networks that link beginning teachers in the field with experienced educators in classrooms and at universities. Several electronic networks for educators are currently in operation. All of the networks share the

same purpose of linking educators together to provide group support and the opportunity to exchange information.

Since the idea of connecting educators together via electronic communication networks is relatively new, there is a lack of empirical data pertaining to the usage and value of these systems. The College of Education at Iowa State University is also attempting to bridge the gap between the world of practice and the university with an electronic communications network entitled the Electronic Educational Exchange. In this study, information was collected on the usage and value of the EEE as a communication tool for Iowa State student teachers, supervisors, and faculty members. The purpose of this study was to determine the effectiveness of electronic networks as support systems for beginning teachers. An initial survey and a final survey were completed by the student teachers pertaining to their background in computers and their experience with the EEE. The university supervisors and faculty members also completed a follow up survey concerning their experience with the EEE. The data collected from these surveys along with the information contained in the system's callerlog and message files were utilized to answer the research questions for the study. A discussion of the results follows.

Discussion of Results

One of the areas of interest in this study was to collect information on the student teachers' usage of the EEE. During the eight week period that data were collected, it was found that the average user

called the EEE almost once a week with the average length of each call being approximately 9 minutes. This is encouraging for an initial measure of the frequency of calls on the system although it is hoped that usage will continue to increase. However, it must also be considered that it may not be necessary for all of the participants to become regular users of the system. Rather, it is more important that they are able to access the system to receive support from other educators at the times when they really need it. This type of usage may be very intense at certain points in educators' careers and less intense at other times. Furthermore, since electronic networks offer a new type of communication, people may need additional support to learn how to integrate this technology into their culture so they may effectively utilize it to enhance their teaching.

In addition to the frequency of calls on the system, it was also found that the fifty-eight student teachers, supervisors, and faculty members on the EEE generated a total of 407 private messages and 53 public messages. It is interesting to note the large contrast between the number of public and private messages that were sent. A possible explanation for this might be that the student teachers on the EEE preferred to send messages to people they were already acquainted with rather than to post messages in the public mail section where all of the users could see them. If this were the case, then further support is provided for the need to have face to face meetings where users of a network can become acquainted and establish group rapport (Katz et al., 1987). As the users become more familiar with each other, they

may feel more comfortable posting a concern in public mail. These findings are also supported by the work of Bloom and Rabinowitz (1985) and Katz et al. (1987).

Data were also collected to determine the effect that previous computer experience had on usage of the system. The results showed that there was no relationship between the number of calls the student teachers made and their measure of computer experience. This seems to indicate that the system was easy to use for people with varying amounts of computer experience and that people with little computer experience were not intimidated by the system. The data collected from the faculty surveys and interviews as well as some general comments made during the individualized training sessions indicate that the faculty and supervisors also found the system to be easy to use. The amount of computer experience also varied for this group. Given the fact that beginning computer users felt comfortable using the EEE and considering the capabilities of this technology to link people and information together, it is possible that this might be an excellent way to introduce beginning teachers and university faculty members to computers and allow them to enjoy the benefits of a powerful computer application at the same time.

Another consideration was to determine the type of interactions that took place on the EEE. An analysis of the system message files indicated that sharing of student teaching experiences among student teachers was the most common type of interaction on the system. This appears to be consistent with Lortie's findings that younger teachers

prefer to receive help from their peers or those closest to them in rank (Lortie, 1975). Based on this information, it would seem beneficial to encourage the student teachers to communicate with each other initially in order to help them get started using the system. It might also be suggested that the student teachers would feel more comfortable talking to the faculty members after they have had more time to adjust to communicating over the system. In addition, it could also be helpful to include the faculty members in the group meetings so the student teachers could become better acquainted with them initially.

Data were also collected to determine if the student teachers' experience with the EEE influenced their attitude toward personal or educational applications of the computer and if they were more likely to use other computer activities in their future teaching because of their experience with the EEE. Several of the questions in this area produced significant results. However, since there was no control group, it can not be determined if the changes were related to the student teachers' experience with the EEE.

Further analysis was conducted to find out if student teachers who used the system more regularly had a greater change in responses. However, a regression analysis showed no significant relationship between the number of times a student teacher called the EEE and the amount of change in their attitude toward computers or their plans for future computer usage in the classroom. This would be an interesting area for future research.

In order to measure the value of the EEE as a communication tool, the student teachers were asked questions pertaining to the usefulness of the system for communicating with their peers, university supervisors, and ISU faculty. The results indicated that the regular users of the system found it to be useful, while those who used the EEE very little felt it was not useful. This finding is also supported in the research of Bloom and Rabinowitz (1985) on the EIES network. This may indicate that if people are willing to try to use the technology, then they are able to realize the benefits of it. However, if they never use the system, then they can not see the advantages of it. This information indicates that the challenge for network developers is to get the participants to try to use the system and help them develop the habit of using it effectively so they do realize the advantages of this type of communication.

Another consideration was to determine if the ISU faculty and supervisors were gaining useful information about the student teachers' experiences in the field from the EEE. Most of the faculty and supervisors felt that the EEE is or could be a useful tool for learning about problems encountered by student teachers. However, the usage of the system by the faculty and supervisors also needs to increase in order for this to happen. Again, the challenge in this area seems to be getting people to try to use the system effectively and helping them to develop the habit of using it.

The last area of consideration was to determine how the EEE should be modified to better serve the needs of new teachers and university

faculty and supervisors as an effective communication tool. First, most of the student teachers felt that the EEE should be continued and a majority of them were interested in using it during their first year of teaching. This indicates that the student teachers appreciate the idea of a support system for beginning educators. The most frequent suggestion for improving the system was to get more incoming phone lines to the host computer to handle all of the callers. This is an essential need for the system as users become discouraged when they can not access it conveniently and usage begins to decrease. Another common suggestion made by the student teachers was to introduce them to the EEE earlier in their college career so they were more familiar with it by the time they were student teaching. The reasoning behind this seemed to be that they were very busy during student teaching and would appreciate the system more if they were already comfortable with it. Most of the ISU faculty and supervisors also felt that the system should be continued. This demonstrates an understanding for the need of a support system for beginning teachers and a willingness on their part to participate in the effort to provide one. The supervisors and faculty members cited improved communication between student teachers and university personnel as the greatest advantage of the system. When asked for their suggestions for improving the EEE, the need for more hardware in the schools and at the university to support the project was mentioned again.

Suggestions for Developing and Implementing a Network

Developing and implementing an electronic communication network can be a very challenging task. Based on the experiences of the researcher and the work of others in this area, the following suggestions for meeting this challenge are offered.

The first consideration when designing the system is that it must be easy for people with little computer experience to use. The system should be menu driven and the options should be fairly intuitive. It is also important for the telecommunications software that is used to connect with the host to be user friendly. This would also involve menus as well as the ability to store the telephone number of the network and dial it with the push of a single key. These findings are also supported in previous research by Katz et al. (1987) and Resta (1988).

Once the system is on-line, it is essential for the users to be able to access it conveniently. Therefore, it is necessary to have a sufficient host computer and an adequate number of incoming telephone lines to support the users of the system. It is also necessary for the users to have convenient access to hardware that will enable them to connect with the host. This may involve visits to the sites by the network developers to ensure that the necessary equipment is installed and functioning correctly. These recommendations were also mentioned by Schrum (1988) and Resta (1988). If these conditions are not met, then usage will begin to decrease as users become frustrated and discouraged with the system.

Given that the necessary hardware is available, the next challenge involves preparing the participants to use the system and providing technical support. A basic demonstration on logging on, sending and receiving public and private mail, and logging off the system can be an effective way to train large groups of participants if the system is fairly easy to use. It is also helpful to prepare short handouts listing the directions for connecting with the system for the types of software the participants will be using and basic information on how to navigate around the system once the users are on-line. Further support can be provided for users by offering individualized training at remote sites, on-line help by the system operator using the synchronous communication capabilities available on most host computers, and telephone assistance. Katz et al. (1987) also recommended these techniques for providing user preparation and technical support.

After the participants have received adequate preparation for using the network, it is essential for them to have a purpose or reason for accessing the system. The work of Katz et al. (1987) and Riel (1989) provides further support for this idea. One suggestion for providing a purpose for the users involves pairing the student teachers or users with partners who share similar interests as well as a faculty member or mentor so they have someone on the system waiting to communicate with them immediately. It should also be noted that the student teachers seem to want to share their experiences with each other. Therefore, it is important to make them aware that the EEE provides an excellent means for communicating with other student teachers

about their experiences in the classroom. Another strategy involves identifying the type of support and information that the users will need as they begin their student teaching experience and then creating special interest conferences that focus on those topics. For example, creating bulletin boards is one of the requirements for student teachers at Iowa State. In order to provide a resource of bulletin board ideas for the student teachers, a special conference was created on the EEE where ISU faculty and supervisors as well as other experienced educators on the system could post ideas for bulletin boards that the student teachers might be able to use in their classrooms.

After the users begin to access the system, it will still take some encouragement to get them to develop the habit of using the network and to further facilitate interactions on the system. This will require a great deal of support by the network developers. This finding is also supported by the research of Katz et al. (1987). In order to facilitate interactions, the participants must become acquainted with other users on the system with whom they can communicate. One way to accomplish this is to schedule group meetings when the users can meet each other in person and begin to develop relationships with others with similar interests and backgrounds. Another suggestion involves creating a section on the network where new users introduce themselves. The introductions would include information pertaining to the school and grade level where the participants are teaching as well as other information on their professional interests. The system operator can also help the participants become acquainted with each

other by introducing new users on the system to other people with similar interests. As the users begin to communicate with more people on the system, the amount and type of interactions will increase and the network should become an essential communication tool and resource for the participants.

Recommendations for Future Research

Since the idea of connecting educators together via electronic communication networks is relatively new, there are several areas where further research is necessary. One area involves identifying the differences between users and nonusers of this type of communication. This would entail determining what motivates people to access a network frequently and utilize it effectively. It would also include what needs to be done to encourage nonusers to become regular users. One approach to identifying a solution to this problem might involve collecting data pertaining to the advantages and disadvantages of electronic communication as viewed by both groups. The data could then be analyzed to detect any patterns in the attitudes toward networks between the users and nonusers. A related concern is how usage can be increased overall for both users and nonusers of electronic networks.

Another interesting area includes studying the evolving use of the system. One aspect of this question would be to determine the length of time from when a user is introduced to a network to the time that usage becomes critical to the user. In other words, how long does it

take for a person to become a frequent and effective user of a system? It would also be interesting to determine if this varies based on the system and what characteristics of networks might affect this potential variance. A second aspect in this area includes studying usage patterns over time. This might entail determining if usage levels off or decreases after it peaks. This would demonstrate if effective users continue to use the system or if their usage decreases as the novelty of the network wears off. It would also be interesting to determine if the type of usage changes over time. This might include an increase in the number of public messages sent as users become more confident and sophisticated in using the system as well as a change in the people with whom they are communicating.

A possible limitation of the previous study is that the population of elementary education student teachers that were targeted to use the system were not as isolated as other groups of educators. In most cases, there were other student teachers in the building and the schools were located relatively close to the university campus. Other groups of educators such as secondary education student teachers, first year teachers, or administrators would seem to be more isolated due to the fact that they may be the only person in the school in their situation. Future research in this area might include determining if they use the system more frequently and effectively and if they believe it is more useful because they are more isolated from their colleagues.

It should also be noted that the cause of the changes in attitude concerning computer applications and future plans for using computers

in the classroom could not be attributed to the student teachers' experience with the EEE because there was no control group. Additional research in this area should include a control group so the effect of an electronic network on these variables can be determined.

Given the recent application of electronic communication networks in the field of education, it is difficult to determine the impact this type of communication will have on educators in the future. However, based on the experience with the Electronic Educational Exchange at Iowa State University, it appears that electronic communication networks have some interesting possibilities for linking educators together to share information and reduce the professional isolation of teachers.

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APPENDIX A. INITIAL STUDENT TEACHER SURVEY FOR THE EEE

Student Teacher Survey for the Electronic Educational Exchange Initial Questionnaire

Please fill out the sections for your name and social security number on your answer sheet. Then, indicate your response by darkening in the corresponding oval for each question on your answer sheet.

1. Sex:
   a. male
   b. female

2. Age:
   a. 20-25 years
   b. 26-30 years
   c. 31-35 years
   d. 36-40 years
   e. 40 and over

3. Cumulative Grade Point Average:
   a. 3.5-4.0
   b. 3.0-3.49
   c. 2.5-2.99
   d. 2.0-2.49

4. Area of Concentration:
   a. reading
   b. math
   c. educational computing
   d. other

5. How many college level computer classes have you taken?
   a. one
   b. two
   c. three
   d. four or more

6. Have you taken Secondary Education 101?
   a. yes
   b. no

7. Do you own a computer?
   a. yes
   b. no

8. How often do you use a word processor program on the computer?
    a. never
    b. daily
    c. weekly
    d. monthly

9. How often do you use a data base program on the computer?
    a. never
    b. daily
    c. weekly
    d. monthly

10. How often do you use a spreadsheet program on the computer?
    a. never
    b. daily
    c. weekly
    d. monthly

11. Have you ever used telecommunications with a computer?
    a. yes
    b. no

12. How often do you use the computer for completing your homework?
    a. never
    b. daily
    c. weekly
    d. monthly

13. How often do you use the computer for personal work?
    a. never
    b. daily
    c. weekly
    d. monthly

Please indicate the intensity in which you agree or disagree with each statement by darkening in the corresponding oval for each question on your answer sheet.

14. I feel that computers make my school work easier.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

15. I see the computer as a useful tool for my personal work.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

16. I feel that computers make my school work more enjoyable.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

17. The computer is useful for accessing and organizing information.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

18. Word processing makes writing more enjoyable.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

19. Computers can help people learn to think more effectively.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

20. Teachers should know how to use a computer.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

21. The computer should be integrated into the curriculum.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

22. I feel confident using a computer to complete my work.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

23. I feel comfortable using a computer in my teaching with children.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

24. I plan to use the computer in my teaching.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

25. I plan to keep my grades for my students on a spreadsheet.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

26 - 30. I plan to use the computer in my classroom with:
    26. drill & practice programs.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

    27. tutorials.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

28. word processor, spreadsheet, and data base programs.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

29. telecommunications.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

30. simulations and problem solving software.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

31. Overall, I feel that the computer is a very important tool for my teaching.
    a. strongly agree
    b. agree
    c. undecided
    d. disagree
    e. strongly disagree

APPENDIX B. FINAL STUDENT TEACHER SURVEY FOR THE EEE

Student Teacher Survey for the Electronic Educational Exchange Final Questionnaire

This survey is designed for use with student teachers who are using the Electronic Educational Exchange in the fall of 1988. The results of this survey will be used to improve and expand the current EEE system for future student teachers and first year teachers. Your cooperation would be greatly appreciated; however, you are not required to complete this survey if you do not wish to. Every effort will be made to keep all data confidential and all survey results will be reported as group rather than individual results.

Section 1: Reactions to the Electronic Educational Exchange

In this section, we would like you to respond to some questions pertaining to your experience with the Electronic Educational Exchange. We are interested in the following three aspects of your EEE experience: the usefulness of the system, the educational issues you discussed on the EEE, and the preparation you received for using the system along with the quality of your experience.

Usefulness: The following questions pertain to the usefulness of the EEE as a communication device for you. Using the rating scale below, please indicate the intensity in which you agree or disagree with each statement by darkening in the corresponding oval for each question on your answer sheet.

Strongly Agree..... a
Agree..... b
Undecided..... c
Disagree..... d
Strongly Disagree..... e

1. The EEE facilitated my communication with ISU faculty during my student teaching experience.....	a	b	c	d	e
2. The EEE facilitated my communication with my supervisor during my student teaching experience.....	a	b	c	d	e
3. The EEE facilitated my communication with my peers during my student teaching experience.....	a	b	c	d	e
4. I benefitted from the increased interaction with my peers on the EEE during my student teaching experience.....	a	b	c	d	e
5. The EEE helped me to feel less isolated from my peers during my student teaching experience.....	a	b	c	d	e
6. The EEE helped me to feel less isolated from ISU faculty during my student teaching experience.....	a	b	c	d	e
7. The ability to receive suggestions and help from other educators on the EEE reduced my anxiety about student teaching.....	a	b	c	d	e
8. I feel my student teaching experience was enriched as I could communicate with experts in the field of education on the EEE.....	a	b	c	d	e
9. My experience with the EEE has encouraged me to use telecommunications in my teaching.....	a	b	c	d	e
10. I would be interested in using the EEE during my first year of teaching.....	a	b	c	d	e

Please indicate your response by darkening in the corresponding oval for each question on your answer sheet.

11. The most useful aspect of the EEE was the ability to communicate with my
    a. peers
    b. supervisor
    c. ISU faculty

12. The least useful aspect of the EEE was the ability to communicate with my
    a. peers
    b. supervisor
    c. ISU faculty

Educational Issues: The following questions pertain to the type of educational issues you discussed with other educators on the EEE. Using the rating scale below, please indicate the intensity in which you agree or disagree with each statement by darkening in the corresponding oval for each question on your answer sheet.

Strongly Agree . . . . . a
Agree . . . . . b
Undecided c
Disagree . . . . . d
Strongly Disagree . . . . . e

13 - 17. I used the EEE to communicate with others about:

13. resource materials and people	a	b	c	d	e
14. teaching strategies and ideas	a	b	c	d	e
15. classroom management techniques	a	b	c	d	e
16. discipline techniques	a	b	c	d	e
17. scheduling times for observation with my supervisor	a	b	c	d	e

Preparation: The following questions pertain to the preparation you received for utilizing the EEE and the quality of your experience with the system. Using the rating scale below, please indicate the intensity in which you agree or disagree with each statement by darkening in the corresponding oval for each question on your answer sheet.

Strongly Agree. . . . . .a
Agree . . . . . b
Undecided c
Disagree . . . . . d
Strongly Disagree . . . . . e

18. I received adequate training for utilizing the EEE.	a	b	c	d	e
19. I had difficulty with the computer in my school when I used it to call the EEE.	a	b	c	d	e
20. I had difficulty connecting with the EEE because the phone line was busy.	a	b	c	d	e
21. I found the EEE system to be easy to use.	a	b	c	d	e
22. I felt the directions for the EEE were unclear.	a	b	c	d	e
23. The questions that I asked on the EEE were answered promptly.	a	b	c	d	e

Overall Reactions: In this section, we would like to get your overall reaction to your experience with the EEE for each of the areas above. Using the rating scale below, please indicate the intensity in which you agree or disagree with each statement by darkening in the corresponding oval for each question on your answer sheet.

Strongly Agree.....a
Agree.....b
Undecided.....c
Disagree.....d
Strongly Disagree.....e

24. The EEE was a useful system for me..... a b c d e

25. I received adequate preparation for utilizing the EEE..... a b c d e

Please write any comments in response to the questions below.

26. I believe that the EEE program should be continued.

_____ yes _____ no

Why or why not?

---

27. What was the most valuable part of the EEE for you?

---

28. What suggestions do you have for the future use of the EEE?

Section 2: Personal Applications of the Computer

In this section, we would like you to respond to some questions pertaining to computer applications in your personal work. We have included items from the initial questionnaire in this section because we are interested in determining if your attitude toward these topics has changed during your student teaching experience.

Please indicate your response by darkening in the corresponding oval for each question on your answer sheet.

29. How many college level computer classes have you taken?
    a. one
    b. two
    c. three
    d. four or more
    e. none

30. Do you own a computer?
    a. yes
    b. no

31. Have you ever used telecommunications with a computer?
    a. yes
    b. no

Using the rating scale below, please indicate how often you utilize the following computer applications in your personal work.

Never . . . . . a
Daily . . . . . b
Weekly c
Monthly . . . . . d

32. How often do you use a word processing program on the computer?	a	b	c	d
33. How often do you use a data base program on the computer?	a	b	c	d
34. How often do you use a spreadsheet program on the computer?	a	b	c	d
35. How often do you use the computer for completing your homework?	a	b	c	d
36. How often do you use the computer for completing personal work?	a	b	c	d
37. How often did your cooperating teacher utilize computer activities in the classroom with his/her students?	a	b	c	d

Using the rating scale below, please indicate the intensity in which you agree or disagree with each statement by darkening in corresponding oval for each question on your answer sheet.

Strongly Agree. . . . . a
Agree . . . . . b
Undecided c
Disagree . . . . . d
Strongly Disagree . . . e

38. I feel that computers make my school work easier.	a	b	c	d	e
39. I see the computer as a useful tool for my personal work.	a	b	c	d	e
40. I feel that computers make my school work more enjoyable.	a	b	c	d	e
41. The computer is useful for accessing and organizing information.	a	b	c	d	e
42. Word processing makes writing more enjoyable.	a	b	c	d	e
43. I feel confident using a computer to complete my work.	a	b	c	d	e

Section 3: Educational Applications of the Computer

In this section, we would like you to respond to some questions pertaining to computer applications in your professional career in education. Again, we have included items from the initial questionnaire in order to determine if your attitude toward these topics has changed during your student teaching experience.

Using the rating scale below, please indicate the intensity in which you agree or disagree with each statement by darkening in the corresponding oval for each question on your answer sheet.

Strongly Agree..... a
Agree..... b
Undecided..... c
Disagree..... d
Strongly Disagree... e

44. Computers can help people learn to think more effectively.....	a	b	c	d	e
45. Teachers should know how to use a computer.....	a	b	c	d	e
46. The computer should be integrated into the curriculum.....	a	b	c	d	e
47. I feel comfortable using a computer in my teaching with children.....	a	b	c	d	e
48. I plan to use the computer in my teaching.....	a	b	c	d	e
49. I plan to keep my grades for my students on a spreadsheet.....	a	b	c	d	e
50 - 54. I plan to use the computer in my classroom with:					
50. drill & practice programs.....	a	b	c	d	e
51. tutorials.....	a	b	c	d	e
52. word processor, spreadsheet, and data base programs.....	a	b	c	d	e
53. telecommunications.....	a	b	c	d	e
54. simulations and problem solving software.....	a	b	c	d	e
55. Overall, I feel that the computer is a very important tool for my teaching..	a	b	c	d	e

APPENDIX C. FACULTY SURVEY FOR THE EEE

Faculty Survey for the
Electronic Educational Exchange

In order to improve and expand the current system, we would like you to respond to some questions pertaining to your experience with the Electronic Educational Exchange. Your cooperation would be greatly appreciated; however, you are not obligated to complete this survey if you do not wish to. Every effort will be made to keep all data confidential and all survey results will be reported as group rather than individual results.

Please write any comments in response to the questions below.

1. What do you see as the strongest possibilities or advantages of the EEE?

2. What do you see as the greatest disadvantages of the EEE?

3. Do you believe that the EEE is or could be a useful tool for learning about problems encountered by student teachers in the field?

_____Yes _____No

Why or why not?

4. Do you believe that the information you acquire from the EEE about student teachers' experiences would be useful for identifying and alleviating problems or weaknesses in the university curriculum for teacher education students?

_____Yes _____No

Why or why not?

5. How should the EEE be modified to better serve the needs of new teachers and university faculty and supervisors as an effective communication tool?

6. What changes should be made to encourage you to use the EEE more frequently?

7. Do you believe the EEE program should be continued?

_____Yes _____No

APPENDIX D. EEE INTERVIEW QUESTIONS FOR ISU FACULTY

EEE Interview Questions
for ISU Faculty & Supervisors

1. Describe your initial experiences with the EEE.

2. What problems did you encounter while you were using the EEE?

3. What positive experiences have you had with the EEE?

4. What suggestions do you have for improving the EEE system?

APPENDIX E. DIRECTIONS FOR THE EEE

Calling the EEE with an Apple Computer

1. Insert the program disk into drive 1 and turn on the computer and monitor.

2. Choose "Dial a service" from the main menu by using the arrow keys to highlight it and pressing return.

3. Next, select the "Electronic Educational Exchange" by pressing return when this option is highlighted.

4. You will hear a loud pitched sound and then a scratching noise. After this sound stops, the phrase CONNECT 1200 will appear on the screen. Press return one or two times to let the system know you are ready to log on.

5. Continue by following the EEE prompts.

Calling the EEE with IBM compatible hardware and PC Talk

1. Put the PC Talk disk in drive A and turn on the computer.

2. At the prompt A: type PC-Talk.

3. Press return to clear the title screen.

4. Hold down the Alt key and press the letter D. A dialing directory will appear on your screen.

5. Depending on your location, you will choose one of the following numbers by typing a 1, 2, or 3.
    1. EEE Local - for calls within Ames
    2. EEE Toll Free - for toll free long distance calls
    3. EEE Campus - for calls from ISU campus

6. You will hear a loud pitched sound and then a scratching noise. After the phrase CONNECT appears on your screen, press return one or two times to let the system know you are ready to log on.

7. Continue by following the EEE prompts.

Calling the EEE with a Macintosh Computer and Red Ryder

1. Insert the program disk and turn on your computer.

2. Click twice on the Red Ryder disk icon to start the program.

3. Click anywhere on the introduction text to continue.

4. Pull down "dial or redial a number" from the service menu.

5. Enter the following information to dial the system:
   ATDT 294 1417 - for calls within Ames
   ATDT 1 800 747 1417 - for toll free long distance calls
   ATDT 4 1417 - for calls on ISU campus

   Note: If you have a pulse phone, type ATDP instead of ATDT.

6. You will hear a loud pitched sound and then a scratching noise. After this sound stops, the phrase CONNECT 1200 will appear on the screen. Press return one or two times to let the system know you are ready to log on.

7. Continue by following the EEE prompts.

Calling the EEE through Iowa State University's ISN Network

1. Turn on your terminal and depress the alpha lock key.

2. Press the break key twice to obtain the Dial prompt.

3. At the Dial prompt, type MODEM1200.

4. Now type ATZ. Do not wait for a prompt.

5. After the OK prompt is returned, type ATDT 4 1417.

6. When the prompt CONNECT 1200 is returned, press the return key once or twice to let the system know that you are ready to log on.

7. Continue by following the EEE prompts.

Logging onto the Electronic Educational Exchange

1. When the phrase Connection made at 1200 baud appears on your screen, you know that you have successfully connected with the EEE.

2. A prompt will appear asking for your first name and then your last name. Go ahead and enter your name.

3. Next, you will be asked to enter your password. Remember to use the password that you wrote down at the EEE meeting.

4. A couple messages will be shown about the system. Just press the return key after you have read them.

5. Next, the main menu for the EEE will appear. At this point, the procedure you will follow will vary depending on what you would like to do. Some options are listed below.

Introductions: Choose the "New User Introductions" option from the main menu by pressing the letter "N". To introduce yourself, select "Post a new introduction". Next, type "all" to send the message to everybody and then enter "student teacher" in response to the subject prompt. Be sure to include your name, the school where you are student teaching, the grade level, and your area of concentration in your introduction. When you are finished, press return on a blank line to obtain the command line. Press the letter S to save your message. To read other introductions choose the option "Read new user introductions". After you are finished, choose the option to "Exit to Main Menu".

Identify partner and faculty member and reading any private message addressed to you: From the main menu, enter the teacher mail section. Next go into the private mail section for teachers and choose to read a private message. A message should appear telling you who your student teacher and faculty member partners are. This is the same process you would follow to read any private message.

EEE Conferences: Select the "EEE Conferences" option from the main menu. Choose the conference which you wish to "attend". To respond to an issue, choose the "post a conference message" option. Be sure to save the message by pressing return on a blank line to obtain the command line and pressing the letter S for save. To read other comments, choose the "read conference messages" option.

Contact Supervisor or other EEE user: From the main menu, enter the teacher mail section. Next go into the private mail section for teachers and choose to send a private message. Enter the name of the person you wish to send the message to. Then, enter a couple of words to describe the main topic or purpose of your message. After you have completed your message, press return on a blank line to obtain the command line and press the letter S to save your message.

Be sure to watch for the Student Teaching Tips section: This section will be coming soon. It will be listed in the public mail section for teachers.

6. In order to log off the EEE, you should type E for Exit to the Main Menu. Then type L for Leave the EEE and finally type Y for Yes, I want to disconnect.

Hopefully, everything went well for you. If you have any problems or questions, please call one of us: Nancy Carley at 294-6840 or Dean Frerichs at 294-1941

"Conferences" on the EEE

Date	Activity
10/19-10/23	Introductions Contact supervisor and faculty member
10/24-10/30	Conference: Learning activities for Halloween Introductions continued Notify supervisor of weekly teaching schedule Contact supervisor and faculty member 2-3 times
10/31-11/6	Conference: Classroom Management Notify supervisor of weekly teaching schedule Contact supervisor and faculty member 2-3 times
11/7-11/13	Conference: Reading, Language Arts, & Social Studies Notify supervisor of weekly teaching schedule Contact supervisor and faculty member 2-3 times
11/14-11/20	Conference: Learning activities for Thanksgiving Notify supervisor of weekly teaching schedule Contact supervisor and faculty member 2-3 times
11/21-11/27	Conference: Math, Science, & Computers Notify supervisor of weekly teaching schedule Contact supervisor and faculty member 2-3 times
11/28-12/4	Conference: Resumes, Job Opportunities, & Future Plans Notify supervisor of weekly teaching schedule Contact supervisor and faculty member 2-3 times
12/5-12/14	Conference: Learning activities for Christmas Notify supervisor of weekly teaching schedule Contact supervisor and faculty member 2-3 times

APPENDIX F. INFORMATION LETTER AND HARDWARE SURVEY FOR PARTICIPATING ELEMENTARY SCHOOLS

N165D Lagomarcino Hall
Iowa State University
Ames, Iowa 50011
August 2, 1988

Hanawalt Elementary School
225 56th Street
Des Moines, Iowa 50312

Dear Principal,

We are pleased that your school is planning to host Iowa State student teachers this fall. In order to facilitate the student teaching experience, a new opportunity is being offered to the prospective teachers. This year, all Iowa State student teachers will have access to the Electronic Educational Exchange (EEE). The EEE is an electronic bulletin board system which is designed to facilitate communication between beginning teachers and Iowa State faculty through telecommunications. The main purposes of the EEE are to decrease the sense of isolation often encountered by student teachers, make faculty expertise readily available to student teachers, and increase education faculty awareness of problems encountered by student teachers. It is hoped that the EEE will be a useful tool which will supplement and support the student teaching experience.

In order to implement this project, we need to identify the hardware needs of the participating schools. The only necessary equipment is: a general purpose computer of any size or kind, a modem which may be used with this computer, telecommunications software, and access to a telephone line. Please note that the computer does not need to be dedicated to this purpose. Also, the student teachers will be calling an 800 number so there won't be any additional phone charges for your school to incur. If your school has any equipment which would be available for use by the student teachers at your school, please indicate this on the enclosed form and return it by August 17. Thank-you for your cooperation!

Sincerely,

Dr. Ann Thompson
Nancy Carley

Available Hardware for the EEE
at
Hanawalt Elementary School
in Des Moines

Please check any equipment that your school would be able to provide for use with the EEE for the student teachers at your school. Also, indicate the type of hardware or software package on the line provided (eg. Apple IIe, Hayes modem, or Apple Access). This will aid us in finding any necessary additional equipment that is compatible with yours. If your school is unable to locate any available hardware, please indicate this by checking the last option.

_____ a computer _____

_____ a modem _____

_____ telecommunications software _____

_____ available telephone line (for after school hours)

_____ no available hardware

Thank-you for taking the time to complete this questionnaire. Please return it in the enclosed envelope by August 17.

APPENDIX G. ISU FACULTY TRAINING REQUEST FORM

July 27, 1988

To: Iowa State Faculty in the College of Education

From: Dr. Ann Thompson
Nancy Carley

Re: Electronic Educational Exchange

We are pleased to announce that the Electronic Educational Exchange (EEE) is ready for use by Iowa State faculty and student teachers this fall. The EEE is an electronic bulletin board system which is designed to facilitate communication between beginning teachers and Iowa State faculty through telecommunications. The main purposes of the EEE are to decrease the sense of isolation often encountered by student teachers, make faculty expertise readily available to student teachers, and increase education faculty awareness of problems encountered by student teachers. It is hoped that the EEE will be a useful tool which will supplement and support the student teaching experience.

Active faculty participation is essential for the success of the EEE. We are in the process of setting up terminals for accessing the system in the Elementary and Secondary Education offices. In addition, directions and a complete manual for the EEE will be located at each station. We encourage you to log onto the system and become familiar with it at your convenience. We would also be happy to provide brief training sessions for interested individuals or groups. For more information, you may contact:

Dr. Thompson	294-5287
Nancy Carley	294-6840
Neal Grandgenett	294-0228

We hope to hear from you soon on the EEE!

If you would be interested in attending a training session, please fill out the form below and return it to Dr. Thompson's mailbox in the Secondary Education main office. Thank-you!

Name: _____
Office: _____
Phone Number: _____

APPENDIX H. STUDENT TEACHER INFORMATION FORM

Electronic Educational Exchange

Name:

_____

Password: (5-8 characters)

_____

School where you are student teaching:

_____

Grade Level:

_____

Area of Concentration:

_____

APPENDIX I. MESSAGE NOTICE FORM FOR THE EEE

A Note from the EEE

Name _____

Date _____

You have a message on the Electronic Education Exchange from _____ pertaining to _____.

Please log onto the system to receive this message.

If you have any questions, please contact one of the following people:

Dr. Ann Thompson	294-5287
Nancy Carley	294-6840
Neal Grandgenett	294-0228
Trev Houck	294-8007

APPENDIX J. HUMAN SUBJECTS COMMITTEE APPROVAL FORM

INFORMATION ON THE USE OF HUMAN SUBJECTS IN RESEARCH
IOWA STATE UNIVERSITY
(Please follow the accompanying instructions for completing this form.)

1. Title of project (please type): An Attitudinal Assessment of Student Teachers Utilizing the Electronic Educational Exchange

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are properly protected. Additions to or changes in procedures affecting the subjects after the project has been approved will be submitted to the committee for review.

Nancy A. Carley	8/15/88	
Typed Named of Principal Investigator	Date	Signature of Principal Investigator
N031 Lagomarcino Hall, ISU	294-6840	
Campus Address	Campus Telephone	

3. Name of others (if any) | Date | Relationship to Principal Investigator

	8/15/88	Major Professor

4. ATTACH an additional page(s) (A) describing your proposed research and (B) the subjects to be used, (C) indicating any risks or discomforts to the subjects, and (D) covering any topics checked below. CHECK all boxes applicable.

- ☐ Medical clearance necessary before subjects can participate
- ☐ Samples (blood, tissue, etc.) from subjects
- ☐ Administration of substances (foods, drugs, etc.) to subjects
- ☐ Physical exercise or conditioning for subjects
- ☐ Deception of subjects
- ☐ Subjects under 14 years of age and(or) ☐ Subjects 14-17 years of age
- ☐ Subjects in institutions
- ☐ Research must be approved by another institution or agency

5. ATTACH an example of the material to be used to obtain informed consent and CHECK which type will be used.

- ☐ Signed informed consent will be obtained.
- ☒ Modified informed consent will be obtained.

6. Anticipated date on which subjects will be first contacted: Month 8 Day 23 Year 88

Anticipated date for last contact with subjects: Month 12 Day 16 Year 88

7. If Applicable: Anticipated date on which audio or visual tapes will be erased and(or) identifiers will be removed from completed survey instruments: Month 1 Day 31 Year 89

8. Signature of Head or Chairperson | Date | Department or Administrative Unit

	8/15/88	Professional Studies in Education

9. Decision of the University Committee on the Use of Human Subjects in Research:

☒ Project Approved ☐ Project not approved ☐ ... on required

George G. Karas	8/18/88	
Name of Committee Chairperson	Date	Signature of Committee Chairperson