Perceptions and Characteristics of Early Adopters of an Electronic Network

by

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CHAPTER I. INTRODUCTION

Background

Considerable research has been conducted on the professional isolation and alienation of teachers. Because of 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). Both researchers and practitioners have expressed concern about the negative implications of the lack of opportunities for professional communication.

Teacher isolation is a major concern within the field of education. Teachers are generally confined to their classrooms and are unable to converse with other educators about problems or concerns (Goodlad, 1983). This issue is often elevated for beginning teachers 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).

In his classic work Schoolteacher, Lortie (1975) describes the "egg crate" nature of teaching, referring to the fact that typically, teachers are isolated in their classroom and little opportunity for interaction with other teachers and experts in the field exists. Usually, it is difficult for these first year teachers to communicate with the people who have trained them in the university. Thus, beginning teachers are often left to solve problems on their own. Lortie (1975) attacks the abrupt transition into teaching when he states "compared with the crafts, professions and highly skilled trades, arrangements for mediated entry are primitive in teaching".

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 concerning teacher isolation. The sample consisted of 73 elementary teachers, 36 junior high teachers, and 87 high school teachers. The results indicated that many teachers felt isolated from other educators. 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 the classrooms by peer or evaluators were rare, as were their own visits to the classrooms of other teachers.

A 1984 Wisconsin study (Stone, 1988) revealed that the most academically able were among the first to leave education, and that they were doing so in increasing numbers. According to the study, within five years approximately 50 percent of the practicing teachers in the field of education leave the profession. Nationwide, approximately 15 percent of the new teachers leave after their first year of teaching, compared to the over all teacher turnover rate of six percent. Thus, the study indicated that the first-year teacher is two-and-one-half times more likely to leave the profession than his or her more experienced counterpart. The study predicted that of all first-year teachers who enter the profession, 40 to 50 percent will leave during the first seven years of their careers, and more than two-thirds of those will resign in the first four years of teaching. The study also stated that teachers' insecurity and uncertainty about what to teach and what the most effective method is, often results in serious problems regarding discipline, student motivation, individual student differences, and classroom organization.

A recent solution to the teacher isolation problem involves the evolution of electronic computer networks that link educators through telecommunications. An electronic network consists of a host system that controls the operation of all electronic mail between users. The host system is accessed using personal computers, modems, and software. Participants use personal computers to enter messages 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. This allows beginning teachers to share problems or concerns as well as positive aspects of their professional experience with one another. Also, the system allows beginning teachers to communicate with experienced educators in the field.

Electronic communication networks for teachers are beginning to develop throughout the world. Although networks normally focus on one aspect of education, such as science or art, they all share the philosophy of "bridging the gap" between educators. However, the networks vary in the number of services or options that they offer 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 an institution using an electronic network for student teachers (Canning, 1988). This project involves the linking of 80 student teachers with outstanding teachers and administrators and the University of Michigan faculty. 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 of student teachers. 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 on a specific topic such as mathematics. A specific menu is programmed on the network to support the conferences.

A similar project for teachers is in progress at the University of New Mexico (Bruder, 1988). CISCO-Net (Computers in Science Classrooms) was designed to link together thirty-five science teachers in remote areas around the state. The system has now expanded to 375 users including participants from seventy-five of the eighty-five school districts in the state. CISCO-Net not only offers electronic mail but two basic programming and reading courses, bulletin boards, student advisement, an electronic magazine, and sixteen databases for use by the teachers.

The Florida Legislature founded FIRN (Florida Information Resource Network) in an effort to electronically link all agencies, institutions, and schools in its public education system (Watson, 1986). The communication link, thought to be one of the most advanced in the nation, has three purposes: (1) to provide equal access to computing resources for all public education entities in the state for both administration and instruction; (2) to reduce the data burden on teachers and administrators while providing timely, high-quality data at all levels; and (3) to enable the rapid and effective exchange of computerized information within the public education system. Information exchange is taking place between 67 school districts and

33 area vocational technical centers, 28 community colleges, and the 9 state universities.

The College of Education at Iowa State University is another site where an electronic network for teachers has been developed. The college is attempting to bridge the gap between the world of practice in the classroom and education faculty at the university via an electronic communication network entitled the Electronic Education Exchange (EEE). The EEE is designed to serve the following purposes:

I. Provide a convenient method for the exchange of ideas between student teachers, practicing teachers, and Iowa State faculty.

A. To decrease the sense of isolation often encountered by student and practicing teachers.

B. To make faculty expertise readily available to student and practicing teachers.

C. To increase faculty awareness of the problems frequently encountered by student and practicing teachers.

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

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 mentioned earlier, each network had a specific educational purpose depending on its target audience. The purpose may vary from connecting teachers in general

to the exchange of computerized information within a public education system. All of the networks include the capability to communicate with a specific individual or conference with all users of the system via electronic mail.

As electronic communication networks develop, such systems become more commonplace as potential users become aware of the innovation. Although networks are becoming more visible to educators, the adoption and diffusion of electronic communication systems has been varied. Some networks are heavily used, some used only lightly and others have been discontinued due to lack of use. It is clear that diffusion of this innovation in innovation has not been rapid. Rogers (1986) developed an adoption/diffusion theory of innovations that provides a theoretical framework to help us understand the adoption, diffusion, and utilization of electronic communication networks in education.

Adoption/Diffusion of Innovations

With all new products and processes, an adoption/diffusion cycle occurs as potential users become aware of the innovation, judge its relative value, make a decision based on that judgement, implement or reject the innovation, and seek confirmation of the adoption/rejection decision. Dede (1990) stated that in order for an innovation to be seen as valuable by it's target audience it must be perceived as being ten

times better then the idea it supersedes. Electronic communication networks are one of the most recent technologies to begin the diffusion process through the educational system. Research on electronic communication networks is valuable to educators developing and managing networks. More specifically, research determining characteristics of early adopters and how they judge the value of such systems is necessary because this information helps researchers and developers understand and improve use of the innovation. The adoption/diffusion theory (Rogers,1986) provides a framework in which this research can be conducted.

Rogers (1986) stated that the four main elements in the adoption/diffusion process are the innovation, communication channels, time and the social system. Rogers defined an innovation as an idea, practice or object that is perceived as new by an individual.

According to Rogers (1986), diffusion is the process by which an innovation makes its way through a society or specific group of people. The process of diffusion includes 3 components: 1) the innovation, 2) an individual or other unit of adoption who knows about or has experience with the innovation, and 3) a communication channel which provides a means of information exchange between the parties. Communication channels include two types: 1) mass communication channels, 2) interpersonal channels.

Diffusion is concerned primarily with the innovation and the adoption of the innovation. Following the introduction of the

innovation, an evaluation process takes place on the part of the consumer. Diffusion of an innovation through a social system is determined by characteristics of the adopter and the perceived value of the innovation.

Early adopters have been found to possess common personal characteristics. In past research common characteristics of early adopters have been found in the categories of socioeconomic status, communication behavior, and personality traits. More specifically, research has concluded that personal characteristics early adopters have in common are their:

1. Education Level
2. Social Status
3. Social Participation
4. Cosmopolitan Outlook
5. Mass Media Use
6. Personal Communication
7. Degree of Innovation Information Seeking
8. Attitude Toward Change
9. Attitude Toward Risk
10. Aspirations
11. Attitude Toward Fatalism

One of the important individual differences in length of the innovation-decision period is on the basis of adopter category. Early

adopters have a shorter innovation-decision period than later adopters. The first individuals to adopt a new idea (the early adopters) do so not only because they become aware of the innovation somewhat sooner than their peers, but also because they require fewer months and years to move from knowledge to decision (Rogers and Shoemaker, 1971).

Early adopters model change agents. A change agent is a professional who influences innovation-decisions in a direction deemed desirable by a change agency (Rogers and Shoemaker, 1971). Early adopters of innovations play an important role in the diffusion process. Their initiative to adopt an innovation is observable by the later adopters, especially the early majority. This observance by the later adopters influences their adoption and thus the success of the innovation.

The early adopters also serve as a filter for innovations. If the early adopters have a poor perception of an innovation, the innovation will be filtered out of the system but if the early adopters perceive the innovation as worthy they filter the innovation through the social system. Therefore, early adopters initial perceptions of an innovation is an important element in the diffusion process.

According to Rogers (1986), adopters' perceptions of an innovation are also a vital element in the diffusion process. He has concluded that there are five dominant characteristics that adopters use to judge the value of an innovation. These characteristics include:

Relative Advantage - the degree to which an innovation is perceived as being better than the idea it supersedes. The relative advantage of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.

Compatibility - the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of the receivers. The compatibility of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.

Triability - the degree to which an innovation may be experimented with on a limited basis. The triability of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.

Complexity - the degree to which an innovation is perceived as being relatively difficult to understand and use. The complexity of a new idea, as perceived by members of a social system, is negatively related to its rate of adoption.

Observability - the degree to which the results of an innovation are visible and easily communicated to others. The observability of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.

The adoption, implementation, and utilization of new communication technologies, such as electronic communication

networks, can be studied effectively based on the theoretical framework of the adoption/diffusion theory. Diffusion of an innovation is determined by personal characteristics of adopters in a social system and their perceived value of the innovation. In order for an innovation to be successfully adopted within a social system a diffusion process, the process by which an innovation makes its way through a society or specific group of people, must occur. Therefore, the present study, "Perceptions and Characteristics of Early Adopters of an Electronic Network", will use the adoption/diffusion theory as a framework to study the evolution of use of the Electronic Educational Exchange.

Statement of the Problem

The manner in which educational institutions are organized generally restricts teachers to their classrooms, which limits interaction with one another. Teacher isolation is currently a major concern within the field of education. Many communication formats such as journals, office memos and school calenders serve as methods of mass communication, but alternative methods that facilitate interpersonal communication must be examined.

Electronic communication networks are relatively new systems that have been proposed as one method to decrease teacher isolation. Although research has begun to indicate that electronic networks seem to be a "natural fit" to meet many needs in the teaching profession,

networks haven't been adopted and diffused on a large scale basis. There is a need to collect data on characteristics of early adopters to better understand the people and why they use electronic networks as a communication device. There is also a need to understand the evolution of network use. In order to determine this information a theoretical framework must be implemented. The adoption/diffusion theory provides us with the framework needed in order to evaluate the adopters of electronic networks, their use of the networks and the evolution of electronic communication networks. The data will assist individuals and organizations in the implementation and management of electronic communication networks.

In addition to the need to study the adoption and diffusion of innovations, others have acknowledged the need to collect data specifically on electronic networks. 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. Is there evidence that the services provided actually improve teacher (or student) skills and knowledge or reduce the professional isolation of teachers?

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

Purpose of the Study

The purpose of the study was to collect data on the early adopters of the Electronic Educational Exchange. More specifically, an instrument was developed to collect data to provide a better understanding of adopter's initial and current use of the EEE; adopter's perceptions of the EEE as a communication device; and characteristics of early adopters of the system. The research is designed to provide knowledge of characteristics of early adopters and why they use electronic networks as a communication device. Also, the study should provide information on the evolution of use of the Electronic Educational Exchange that will assist other organizations in the implementation and management of electronic communication networks. Given the lack of previous research on this topic, the study will be primarily descriptive in nature.

Research Questions

Research Question 1 (User Characteristics):

What are the characteristics of early adopters of the EEE?

Do user characteristics compare with characteristics found in completed research of other early adopters?

Research Question 2 (User Characteristics):

How do the users of the system perceive the system?

What was their initial perception of the system compared to their current perception?

Research Question 3 (Usage):

What usage patterns have evolved?

Has the frequency of use changed over time?

What caused the frequency to change over time?

Research Question 4 (Interactions):

What type of interactions take place on the EEE?

What are the most common educational topics addressed on the EEE?

With whom do the interactions occur?

Definition of Terms

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 sent, and the time they logged off the system.

Conference: A public section on an electronic communication network where the conversation if 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 (BBS).

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.

Telecommunication software: Any software that enables network users to communicate via the computer over 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 educators around the world. The Electronic Educational Exchange at Iowa State University was created to fulfill this purpose. Since the idea of connecting educators via electronic communication networks is relatively new, there is a lack of empirical data pertaining to user characteristics and the usage and value of these systems. The purpose

of the study was to explore early adopter's use of the EEE as a communication device. More specifically, the purpose of the study was to collect information to provide a better understanding of adopters' usage of the EEE; how adopter's use has progressed over time; adopters' perceptions of the EEE as a communication device; and characteristics of early adopters of the system. This information provided by early adopters should provide a valuable base for educators creating and implementing electronic communication networks.

CHAPTER II. LITERATURE REVIEW

This literature review begins with a review 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, research on the use of these networks is reviewed, and finally the adoption/diffusion theory of innovations in society is discussed. The adoption/diffusion section focuses on the characteristics of early innovation adopters and how the early adopter's perception of the innovation affects the diffusion process.

Teacher Isolation

Considerable research has been conducted on the professional isolation and alienation of teachers. Because of 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). As a result, teaching is becoming an imperiled profession. For this reason, teaching has been referred to as the "lonely" profession (Sarason, 1966). The teaching climate has been characterized by "loneliness and powerlessness and a decline in the enthusiasm of teaching". Teacher isolation is a major concern within the field of education.

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 concerning teacher isolation. The sample consisted of 73 elementary teachers, 36 junior high teachers, and 87 high school teachers. The results indicated that many teachers felt isolated from other educators. 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 the classrooms by peer or evaluators were rare, as were their own visits to the classrooms of other teachers.

Teacher isolation is an issue often elevated for beginning teachers 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). Most first year teachers have little opportunity to communicate with their more experienced colleagues, and thus face the challenges of first year teaching on their own. 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).

A 1984 Wisconsin study (Stone, 1988) revealed that the most academically able were among the first to leave education, and that they were doing so in increasing numbers. Within five years approximately 50 percent of the practicing teachers in the field of education leave the profession. Nationwide, approximately 15 percent of the new teachers leave after their first year of teaching, compared to the over all teacher turnover rate of six percent. According to the study this means that the first-year teacher is two-and-one-half times more likely to leave the profession than his or her more experienced counterpart. The study predicted of all first-year teachers who enter the profession, 40 to 50 percent will leave during the first seven years of their careers, and more than two-thirds of those will resign in the first four years of teaching. The study also stated that teachers' insecurity and uncertainty about what to teach and what the most effective method is, often results in serious problems regarding discipline, student motivation, individual student differences, and classroom organization.

Electronic Communication Networks

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). A recent solution involves the evolution of electronic computer networks that link educators through telecommunications. Electronic communication networks provide the opportunity to "bridge the gap" between educators. The use of electronic communication networks allows educators to overcome their limited interactions by integrating the use of such networks into their individual schedules.

A computer network consists of a host system that controls the operation of all electronic mail between users. The host system is accessed using personal computers, modems, and software. Participants enter messages on their personal computers and these messages 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. This allows beginning teachers to share problems or concerns as well as positive aspects of their professional experience with one another. Also, the system allows beginning teachers to communicate with experienced educators in the field.

Users of electronic communication networks can access the system at times convenient for them. Thus, the classroom teacher, who may be unable to communicate with colleagues during the school day can do so at other times. As a result, electronic networks become a more efficient manner of communication for educators.

Electronic communication networks for teachers are beginning to develop throughout the country. Although networks normally focus on one aspect of education, such as science or art, they all share the philosophy of "bridging the gap" between educators. The networks described in the following paragraphs are grouped together based on the type of users they serve.

Networks for Beginning Educators

The College of Education at the University of Michigan was one of the first higher educational institutions to provide an electronic network for student teachers (Canning, 1988). The university uses its mainframe computer to facilitate this network. This project involves the linking of 80 student teachers with 25 outstanding teachers and administrators, and 20 the University of Michigan faculty. 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 pertaining to teacher preparation and to provide a system of support for student teachers. The system enables educators to communicate with each other by sending private

or public 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.

UNCLE (UNC Link to Educators) is the name of another electronic network; UNC 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 and focuses on offering support for beginning teachers and student teachers. UNCLE offers electronic mail and computer conferencing to the participants on the system.

The Harvard Graduate School of Education is using electronic communication to facilitate communication among first year teachers from its institution (Merseth & Beals, 1989). The Beginning Teacher Computer Network was established for graduates of the three teacher education programs at Harvard. Through the use of a toll free line, Merseth serves as the coordinator for this network along with five other teacher educators from Harvard. The network began in 1987 and served 38 beginning teachers via personal computers and

telephone lines during its first year. A new group of first year teachers used the network during the 1988-89 academic year with 4 or 5 second year teachers continuing on the network. At the end of each school year the network's effectiveness was rated by participants. Results indicated that it provided support throughout the first year of teaching, and a broader perspective on teaching and education.

Networks for Teachers

A project for teachers is in progress at the University of New Mexico (Bruder, 1988). CISCO-Net (Computers in Science Classrooms) was designed to link together thirty-five science teachers in remote areas around the state. The system has now expanded to 375 users including participants from seventy-five out of eighty-five school districts in the state. CISCO-Net not only offers electronic mail but two basic programming and reading courses, bulletin boards, student advisement, an electronic magazine, and sixteen databases for use by the teachers.

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.

State Networks

State networks are being established not only to "bridge the gap" between educators but to decrease the amount of time expanded on administrative tasks The Florida Legislature founded FIRN (Florida Information Resource Network) in an effort to electronically link all agencies, institutions, and schools in its public education system (Watson, 1986). The communication link, thought to be one of the most advanced in the nation, has three purposes: (1) to provide equal access to computing resources for all public education entities in the state for both administration and instruction; (2) to reduce the data burden on teachers and administrators while providing timely, high-quality data at all levels; and (3) to enable the rapid and effective exchange of computerized information within the public education system. Information exchange is taking place between 67 school districts and 33 area vocational technical centers, 28 community colleges, and the 9 state universities.

Fairleigh Dickinson University (FDU) and New Jersey Institute of Technology (NITJ) have developed a new model of in-service education for science teachers designed to increase the opportunities for teacher interaction and the availability of instructional resources; to

eliminate teacher isolation; and to develop inter-district collaboration. This model is supported by the Electronic Information Exchange System (EIES) at NITJ. EIES is a regional computerized resource-sharing network that actively involves teachers in exchanging and integrating successful approaches, materials and curricula into their teaching practices. The network offers educators electronic mail, conferences, notebooks, and tailored communication structures to meet the special needs of users.

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). This communication system called SkolKOM has been developed for teachers and teacher trainees. An additional feature of SkolKOM is on-line databases. The network offers electronic messaging and conferencing capabilities for the educators.

Networks Used to Enhance the Classroom Curriculum

Electronic communication networks are not only being used to decrease teacher isolation but also to enhance the curriculum by allowing students to telecommunicate with students outside of their classroom. Networks have been established for use in all grade levels and subject areas. Some of the networks established to enhance the classroom curriculum are discussed below.

National Geographic has established an electronic network entitled KIDS NETWORK. KIDS NETWORK allows fourth, fifth, and sixth graders to become "real scientists", motivating them to become active in the learning process as they are challenged to research, observe, and study patterns in data. The students then are allowed to share their data with their assigned research teams in geographically diverse classes in the United States, Canada, and other countries. Also, a professional scientist helps students interpret the data. National Geographic provides five, self-contained, eight week units. Teachers integrate the use of KIDS NETWORK into their daily instruction. National Geographic supplies the teachers with lesson plans, activities and supplementary materials to use in the classroom in addition to the telecommunication network. The units consist of Hello, Acid Rain, Too Much Trash, Weather in Action, and What's in our Water. In addition to science related messages students and teachers exchange information about themselves, their cultures, their communities, and their experiments.

Another network, connecting teachers and the students in their classrooms, is LDLN (The Long Distance Learning Network) (Laliberte, 1986). In the 1987-88 school year LDLN, sponsored by AT&T, connected schools to determine the effectiveness of long-distance learning. Teachers from grades four through twelve in over 100 schools in Australia, Canada, France, the Netherlands, West Germany, and the United States participated. Information was exchanged via electronic mail messages that focused on specific topics, such as careers, weather, and fiction writing.

Kid Link is another electronic communication network providing hands-on experience with telecommunications in St. Charles Parish Public Schools, Louisiana. The goal of Kid Link is to introduce students to the use of telecommunications as an avenue to explore the use of technology in the learning process. The objectives of Kid Link emphasize the importance of the following:

1. Teaching students to use state-of-the-art computing tools.
2. Providing for cultural and scientific exchange between divergent cultures.
3. Developing and extending critical thinking skills
4. Incorporating computer technology into the core curriculum.
5. Creating opportunities to facilitate cooperative learning.
6. Building self-confident, independent learners.

Kid Link is a project designed to apply and further discover the contributions that can be made to the instructional program through

the use of telecommunications. Telecommunications is used in the areas of language arts, math, science, and social studies. Students work in a cooperative group setting exchanging information with their partner school. An information base is used to retrieve and exchange data. Services such as electronic mail, on-line encyclopedia, weather updates, electronic bulletin boards, and news services are provided.

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 mentioned earlier, each network had a specific educational purpose depending on its target audience. The purpose may vary from connecting teachers in general to the exchange of computerized information within a public education system. All of the networks include the capability to communicate with a specific individual or conference with all users of the system via electronic mail.

Electronic Communication

Limited Use of Networks

Although electronic communication networks offer possibilities for improving educators communications, many such networks have failed and some have very low use. It is clear that researchers and implementers both need more information in the problems and successes with adoption of electronic communication networks.

Thompson and Carley (1989, p. 1) stated that "Although the capabilities of electronic network systems seems a natural solution to help address teacher isolation, some systems designed for this purpose are not actively used and some have failed due to lack of use. If technology is to be used effectively in this area, it is important that we begin to understand the evolution of use of such systems and some of the challenges involved in making such a system work."

A study at Iowa State University supports the need and value of collecting data on electronic communication networks (Thompson and Carley, 1989). The Electronic Educational Exchange (EEE) was a pilot project designed to investigate the implementation of an electronic communication network for teachers. The initial problem of the system involved getting the participants to use the system. Motivation techniques such as weekly conferences, pairing students with each other and with Iowa State faculty, on-site visits to schools and handing out software set to dial the system facilitated the use of the system. Data were also collected on the use of the system, the following trends were found: student teachers communicated most frequently with other students teachers; private messages were used almost ten times as frequently as public messages; and both day and evening hours were popular times to use the system. In general, the data revealed that participants were positive about the experience and indicated an interest in using a similar system during their first year of teaching. Levin (1990) reported similar findings in usage patterns of an

electronic communication network currently operating at the University of Illinois.

It is clear that diffusion of this innovation has not been rapid and there is a need for further research in the area. Rogers (1986) developed an adoption/diffusion theory of innovations that provides a theoretical framework to help us understand the adoption, diffusion, and utilization of electronic communication networks in education.

Adoption/Diffusion of Innovations

With all new products and processes, an adoption/diffusion cycle occurs as potential users become aware of the innovation, judge its relative value, make a decision based on that judgement, implement or reject the innovation, and seek confirmation of the adoption/rejection decision. Dede (1990) stated that in order for an innovation to be seen as valuable by it's target audience it must be perceived as being ten times better then the idea it supersedes. Electronic communication networks are one of the most recent technologies to begin the diffusion process through the educational system. Research on electronic communication networks is valuable to educators developing networks and managing networks. More specifically, research determining characteristics of early adopters and how they judge the value of such systems is necessary. The adoption/diffusion theory (Rogers,1986) provides a framework for this research to be completed.

Rogers (1986) stated that the four main elements in the adoption/diffusion process are the innovation, communication channels, time and the social system. Rogers defined an innovation as an idea, practice or object that is perceived as new by an individual or other unit of adoption.

According to Rogers (1986), diffusion is the process by which an innovation makes its way through a society or specific group of people. The process of diffusion includes 3 components: 1) the innovation, 2) an individual or other unit of adoption who knows about or has experience with the innovation, and 3) a communication channel which provides a means of information exchange between the parties. Communication channels include two types: 1) mass communication channels, 2) interpersonal channels. The elements of diffusion can not be discussed without acknowledging the social system in which the target group of potential adopters is found. The social system is defined by Rogers as "a set of interrelated units that are engaged in joint problem solving to accomplish a common goal... the members or units of a social system may be individuals, informal groups, organizations, and/or subsystems" (Rogers, 1983, p.24).

Among the members of a social system, there exists a structure of communication. Communication is more apt to occur among individuals who have had common experiences. It has been determined by previous adoption and diffusion research that

individuals evaluate an innovation on the basis of subjective information rather than on the basis of scientific studies (Rogers, 1983).

Finally, one must allow time to elapse in order for the diffusion process to occur. The innovation-decision process, the degree that an individual becomes involved, and an innovation's rate of adoption all need to be considered in the diffusion process. The innovation-decision process is the mental process through which an individual passes from first knowledge of the innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision.

Diffusion is concerned primarily with the innovation and the adoption of the innovation. Following the introduction of the innovation, an evaluation process takes place on the part of the consumer. Diffusion of an innovation through a social system is determined by characteristics of the adopter and the perceived value of the innovation.

Rogers has described 5 categories of people who adopt innovations. These include 1) innovators, 2) early adopters, 3) early majority, 4) late majority, and 5) laggards. The categories of adoption reflect the amount of time that will pass before the individual accepts the innovation. The innovators/early adopters are the first to adopt an innovation and are characterized as having a high degree of mass media exposure with interpersonal relationships that are extensive and which reach beyond their local system.

Characteristics of early adopters that have been found pertinent in past research included (A) socioeconomic status (B) communication behavior and (C) personality traits.

(A) Socioeconomic Status:

Education. Rogers (1983) and other researchers agree on the generalization that innovators and early adopters have more years of formal schooling than others in the audience of an innovation.

Social Status. The generalization that innovators have higher social status can include a number of variables such as total wealth, job prestige, and social class level.

Rogers (1986) stated that one of the most striking characteristics is their socioeconomic status. Whether measured by income, occupational prestige, or in years of formal education, innovative individuals are relatively more elite than those who adopt later (or who reject). Basic reasons for the innovativeness/status relationship are that (1) the new media represent a nontrivial cost, and socioeconomic elites are in a better position to be able to pay, (2) the more-educated are more likely to be aware of the importance of information and to feel a need for it, and (3) certain high-prestige occupations are key figures in the coming Information Society, and they are technically more competent to use the new communication technologies. The positive relationship between socioeconomic status and innovativeness is a basic reason why the new media are widening

the information-gap in society between the information-rich and the information-poor. Because the information-rich adopt the new communication technologies relatively earlier than the information-poor, thanks in part to the higher socioeconomic status of the information-rich, these individuals, households, and organizations gain in information level more rapidly than do the information-poor.

(B) Communication Behavior:

Social Participation. Past research in adopter characteristics has found innovators and early adopters to have more memberships in organizations.

Cosmopolitan Outlook. Researchers have found a positive relationship between cosmopoliteness and innovativeness.

Mass Media Use. Innovators generally use mass media information sources more frequently than others according to previous research.

Personal Communication. Interpersonal relationships outside the local community are often positively related to innovativeness, especially in the early stages of the process of diffusion .

Innovation Information Seeking. Innovators have been found to be considerably more active seekers of information about innovations than others. In general, they have greater knowledge of innovations than others. Innovators have been found to develop relationships with

other innovators despite time, distance, and expense in order to be up to date.

In conclusion, early adopter's communication behaviors can be summarized as:

- More cosmopolite (cosmopoliteness is the degree to which an individual is oriented outside the social system)
- More exposed to mass media channels, and relatively less dependent on interpersonal communication channels
- More exposed to interpersonal communication channels, and more highly interconnected through network links to the system
- More directly in communication with scientific and technical sources of information about the new communication technologies. (Rogers,1986)

(C) Personality Traits:

Attitude Toward Change. Diffusion of innovation researchers say innovators and early adopters have a more favorable attitude toward change.

Attitude Toward Risk. According to Rogers (1983) venturesomeness and great willingness to bear risk are very characteristic of innovators and early adopters. "He or she desires the hazardous, the rash, and the daring and the risky" (Rogers, 1983).

Aspirations. Innovators/early adopters usually have high success goals according to previous studies of adopter categories.

Fatalism. Innovators/early adopters are not fatalistic compared to later adopters. People who believe they have some control over their future are more likely to adopt innovations than those who believe they lack control over their fate.

Finally, earlier adopters of new communication technologies differ from later adopters in certain personality variables. They have greater empathy (the ability of an individual to project himself or herself into the role of another person), less dogmatism (the degree to which an individual has a relatively closed belief system), a greater ability to deal with abstractions, and more rationality (the use of the most effective means to reach a given end).

One of the important individual differences in length of the innovation-decision period is on the basis of adopter category. Early adopters have a shorter innovation-decision period than later adopters. The first individuals to adopt a new idea (the early adopters) do so not only because they become aware of the innovation somewhat sooner than their peers, but also because they require fewer months and years to move from knowledge to decision (Rogers & Shoemaker, 1971).

According to Rogers & Shoemaker (1971), research studies show that early adopters have more favorable attitudes toward new ideas and so less resistance to change must be overcome by communication messages about the ideas. Early adopters may also have

shorter innovation-decision periods because (1) they use more technically accurate sources and channels about innovations, and (2) because they place higher credibility in these sources than the average individual. Early adopters may also possess a type of mental ability that better enables them to deal with abstractions. An early adopter must be able to conceptualize relatively abstract information about innovations and apply this new information to his own situation. Later adopters can observe the results of innovations by earlier adopters and may not require this type of mental ability.

Early adopters model change agents. A change agent is a professional who influences innovation-decisions in a direction deemed desirable by a change agency (Rogers & Shoemaker, 1971). Early adopters of innovations play an important role in the diffusion process. Their initiative to adopt an innovation is observable by the later adopters, especially the early majority. This observance by the later adopters influences their adoption and thus the success of the innovation.

The early adopters also serve as a filter for innovations. If the early adopters have a poor perception of an innovation, the innovation will be filtered out of the system but if the early adopters perceive the innovation as worthy they filter the innovation through the social system. Therefore, early adopters initial perceptions of an innovation is an important element in the diffusion process.

According to Rogers & Shoemaker (1971), adopters' perceptions of an innovation are also a vital element in the diffusion process. He has concluded that there are five dominant characteristics that adopters use to judge the value of an innovation. These characteristics include:

Relative Advantage - the degree to which an innovation is perceived as being better than the idea it supersedes. The relative advantage of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.

Compatibility - the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of the receivers. The compatibility of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.

Triability - the degree to which an innovation may be experimented with on a limited basis. The triability of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.

Complexity - the degree to which an innovation is perceived as being relatively difficult to understand and use. The complexity of a new idea, as perceived by members of a social system, is negatively related to its rate of adoption.

Observability - the degree to which the results of an innovation are visible and easily communicated to others. The observability

of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.

The adoption, implementation, and utilization of new communication technologies, such as electronic communication networks, can be studied effectively based on the theoretical framework of the adoption/diffusion theory. Diffusion of an innovation is determined by personal characteristics of adopters in a social system and their perceived value of the innovation. In order for an innovation to be successfully adopted within a social system a diffusion process, the process by which an innovation makes its way through a society or specific group of people, must occur.

A study at the Institute of Communication Research at Stanford University supports the adoption and diffusion theory (Rogers, Daley, and Wu, 1982). The study was an explanatory investigation into the adoption and use of microcomputers in the home, which involved interviews with 77 home computer owners, 19 individuals who were in the process of computer adoption, and a small sample of home computer manufacturers and retailers. The characteristics of the subjects supported the adoption/diffusion theory. Rogers et al. reported the following characteristics of subjects included in the study: 1) average age of 36; 2) sixty-eight percent male; 3) average income of $38,000 per year; 4) ninty-six percent have at least some college education; and 5) occupations ranging from scientists/engineers to

students. The subjects perceptions of the system were also measured and found to be high in all categories.

In 1986 a study was conducted to determine who uses the network entitled EXNET. EXNET is an electronic communication device to connect farmers throughout the state of Iowa. The purpose of the study was to determine whether or not farmers who subscribe to EXNET have similar attitudes, opinions, and characteristics to other farmers who have tried a new method, tool or service and to give EXNET subscribers a chance to comment on the quality of the service they receive from EXNET. The study was based on Roger's adoption/diffusion theory. It examined users socioeconomic status, communication behavior, and personality traits found to be associated with innovativeness and early adoption. In addition, EXNET's relative advantage, compatibility, complexity, triability and observability were rated by the subscribers.

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 teachers in the field with educators in classrooms and at universities. Ideally, these networks become electronic support systems for 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.

The components of Roger's theory of the Adoption and Diffusion of Innovations were presented. The relationship between characteristics of early and the importance of their perception of an innovation in the diffusion process was explored. Research has shown that the adoption and diffusion of innovations can be studied effectively using the adoption/diffusion theory.

CHAPTER III. METHODOLOGY

Purpose of the Study

The purpose of the study was to collect data on the early adopters of the Electronic Educational Exchange. More specifically, an instrument was developed to collect data to provide a better understanding of adopter's initial and current use of the EEE as the system has diffused; adopter's perceptions of the EEE as a communication device; and characteristics of early adopters of the system. The research is designed to enhance knowledge of early adopters' characteristics and why they use electronic networks as a communication device. Also, the study provides information on the evolution of the Electronic Educational Exchange. This study should assist other organizations in the implementation and management of electronic communication networks.

This chapter begins with a description of the sample involved in the study and the instruments that were used to collect the data. Next, a description of the system is presented. The chapter concludes with a discussion on the plans for data analysis.

Sample

In order to conduct this study, a list of the most frequent EEE users in the Spring of 1990 was generated. The most frequent or

heavy users of the system were defined as early adopters of the innovation.

Iowa State student teachers are one group of educators who use the EEE to facilitate communication. The student teaching experience is divided into two, eight week periods to allow each student teacher experience in two schools and grade levels. The two, eight week periods ran from January 22 to March 16 and March 19 to May 15. Previous studies have shown that student teachers become more involved in network activities outside of the classroom during their second experience (Thompson, 1990). Due to the increase of student teachers during the second half of their experience, two time periods were used to determine the heavy users. The two time periods used were January 15th to May 15th and March 15 to May 15th. The heavy users were determined by analyzing the system's callerlog. The process of determining the heavy users involved the following; noting the number of times each user had logged onto the system on the initial dates listed above, noting the number of times the user had logged onto the system on the final dates listed above, and finally the difference was calculated to determine the total number of logins per user during the given time period. To assure accuracy of calculations all data were entered and analyzed using the Microsoft Works spreadsheet. The time period from January 15th to May 15th produced 28 heavy users and the second time period from March 15th to May 15th produced a total of 23 heavy users. The two lists were compiled and it was found that 16 users existed on both lists.

Therefore, a total of 35 subjects were selected from the two time periods analyzed. The subjects consisted of 4 Iowa State professors, 4 Iowa State graduate students, 4 Iowa State student teachers, 2 Iowa State pre-service teachers, 1 professor outside of the university, and 20 educators from the state of Iowa and surrounding states.

Instrumentation

A questionnaire was selected as the instrument to be used in this study. The evaluation tool was identified as the most direct method of attitude assessment for a large group of subjects (Henerson, Morris, & Fitz-Simmons, 1978). Henerson et al. described the questionnaire and the attitude rating scale as devices that: a) permit anonymity, b) provide time for the subjects to think about answers, c) simultaneously reach many people in a large geographical area, d) deliver uniform questions, e) and provide data that be easily analyzed. Following the procedures described by Henerson et al., an instrument was designed (see Appendix A).

Design of Part One

The questionnaire/attitude rating scale was divided into five parts. The purpose of Part One was to obtain background information to establish a profile of characteristics of the heavy users of the EEE. Rogers (1984) stated that characteristics of early adopters of innovations that have been found pertinent in past research include

socioecomonic status, communication behavior, and personality traits. More specifically, Rogers has found early adopters of new media, compared with later adopters have: 1) higher socioeconomic status; 2) different communication behavior including being cosmopolite (cosmopoliteness is the degree to which an individual is oriented outside the social system) and more likely to utilize mass media channels; 3) personality traits including being more favorable attitude toward change, more venturesomeness and great willingness to bear. risk, high success goals, and feel they have control over their life, Further, younger age and male gender is associated with earlier adoption of new media, especially computers.

Based on Rogers (1986) the questions in Part One were written to assess the subject's education level, gender, age, position, years of experience, income, amount of contact with educators outside of their school, and use of media professionally and in the classroom
The questions pertaining to attitude toward technology, risk and fatalism were based on studies by Nancy Carley (1989) and Reed Hamre (1987). In order to avoid subjects getting into a response set, some questions were worded in a positive manner and some were worded in a negative manner.

Internal consistency measure of reliability were calculated for the following three sections of the instrument. For this measure of reliability, coefficient alpha was calculated (Cronbach, 1970). Results are reported in Table 1.

Table 1. Reliabilty Calculations for the Early Adopter Survey

Category	Reliability
Attitude Toward Technology	.7116
Attitude Toward Risk	.7654
Attitude Toward Fatalism	.6298
Attitude Toward EEE Usefulness	.6881

A total of 38 questions were developed to assess the subject's characteristics in these areas (see Appendix B).

Design of Part Two

The purpose of Part Two was to assess the interactions that were exchanged on the EEE. Part Two consisted of two sections evaluating the subject content of messages exchanged and with whom the selected subjects communicated most frequently. These categories where selected after analyzing the message content and users of the system during the Spring of 1990. This information was made available through the system's Userlog and Message Editor.

The Message Editor allowed messages to be printed and analyzed. The messages were printed and summarized by content on a weekly basis. Following a three week period, the summaries were analyzed and categorized by the project director and a graduate student. The following week, messages were placed in the categories

and the categories were slightly modified to include messages that didn't fit in the initial categories. From this analysis the content areas were determined. The content areas found most frequently were curriculum issues, educational issues, educational technology, informational, classroom management issues, system management and personal messages. The content areas for this survey were determined from this data. The early adopters were asked to rate the content of their messages on a likert scale including strongly agree, agree, undecided, disagree and strongly disagree (see Appendix C). The agreement scale used was created following the procedures described by Henerson et al. (1978, pp. 86-88).

Categories in the second section of Part Two were determined by the most common professions of EEE users found in the systems' Userlog. The results of the userlog analysis determined the professions used in the survey. The professions found most common among EEE users were student teachers, 1st year teachers, teachers, graduate students, and ISU faculty. The early adopters were asked to rate their interactions on a likert scale including strongly agree, agree, undecided, disagree and strongly disagree (see Appendix C). The agreement scale used was created following the procedures described by Henerson et al. (1978, pp. 86-88).

Design of Part Three

The purpose of Part Three was to determine the usefulness of the EEE as a communication device to the early adopters. This section

consisted of 10 questions used to measure with whom the EEE facilitates communication, the benefits of the EEE and the role the EEE has played in encouraging users to share their knowledge of telecommunications. The questions in this section were based on a study by Nancy Carley (1989). The questions were adopted and slightly modified to fit the present study. For example, Carley's instrument contained the question "The EEE facilitated my communication with my supervisor during my student teaching experience" was changed to "The EEE facilitated my communication with student teachers". The questions in Part Three were rated on an agreement scale from strongly agree to strongly disagree (see Appendix D).

Design of Part Four

The purpose of Part Four was to measure early adopter's initial and present perception of the EEE. The questions in Part Four were generated by the researcher using Roger's (1986) categories of characteristics and Henerson's (1978) agreement scale. According to Rogers (1986) the characteristics of an innovation, as perceived by the members of a social system, determine its rate of adoption. Part Four rated the participant's initial and current perceptions of the EEE in the areas of relative advantage, compatibility, triability, complexity, and observability. Part Four consisted of 10 questions which were rated on a scale from very high to very low (see Appendix E).

Design of Part Five

The purpose of Part Five was to allow the subjects to express freely views of themselves and the EEE. More specifically, subjects were asked to share educational organizations they are affiliated with, professional goals,with whom they communicate with on the EEE, the content of their messages on the EEE, and how their frequency use has changed over time. Henerson et al. (1978) stated that open-response questions have certain advantages in that they "allow the ventilation of feelings, produce responses that may have been unanticipated by the evaluator, and do not limit the range of possible answers" (p. 61). Six questions relating to research questions 1,3, and 4 (see Appendix F) were included in the open response format to provide an opportunity for the subjects to express their opinions (see Appendix G).

Reliability and Validity of Questionnaire

Construct validity for the questionnaire was determined by the opinion of judges. The questionnaire was submitted to 5 educators who had experience in developing questionnaires and knowledge of the adoption/diffusion theory. They were asked to rate each question on how effectively it measured the corresponding characteristic. The judges rated each question on an agreement scale and were encouraged to add any additional comments or suggestions they may have to improve the instrument. Based upon their responses the construct validity of the instrument was determined to be acceptable.

Reliability and validity for the attitudinal parts of the survey were determined following procedures in Henerson (1978).

The instrument (Electronic Educational Exchange Survey), cover letter, and the procedures to conduct the study were reviewed and met the approval of the Iowa State University Human Subjects Review Committee (see Appendix H).

Distribution of the Questionnaire

Thirty-five members of the Electronic Educational Exchange were identified as heavy users of the EEE during the Spring of 1990. The identified participants were sent the questionnaire along with a cover letter and a postage-paid, return envelope (see Appendix I). The letter informed the participant that they have been identified as a heavy user of the system and described the purpose of the research. To ensure a high rate of return, two weeks after the initial mailing, participants not returning the survey were contacted either via the EEE or the telephone. The form of contact was determined by the participants amount of current use of the system. The final return rate was very high (83%). A total of 29 of the 35 surveys mailed were returned.

Description of the Electronic Educational Exchange Used by the Early Adopters

The EEE is an electronic bulletin board system that is designed to facilitate communication between student teachers, first year teachers, educators throughout the state of Iowa and surrounding states, 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 can 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 and 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 Host is active on the host computer and manages the electronic bulletin board system.

Description of Logging onto the EEE The users of the EEE could use almost any type of computer to connect with the system. The only requirement was that their computer, modem and telecommunication software were compatible to one another. Most participants logged onto the system via a member of the Apple family

including the Apple IIe, IIc, IIGS or Macintosh. In addition to the Apple computers, IBM computers were also used to call the EEE.

After connecting with the EEE, a 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 time of their last call to the system. Finally, the system messages would appear. These were messages that were posted by the system operator for all the EEE participants to view. The message content consisted of information pertaining to upcoming events, changes on the EEE, additional menus on the system and welcoming specific groups to the system.

Main Menu After the system messages were displayed, the main menu for the EEE appeared on the screen as shown in Figure 1. A brief description of each command is listed below Figure 1.

```
============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
<M>erril Middle School Section
<A>stronomy Space & Science Section
<D>iscipline/Classroom Management Section
<N>ew User Introductions
<E>EE Conferences
<L>eave the EEE

Command <U,C,Y,I,T,M,A,D,N,E,L>?
```

Figure 1. 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.

Merrill Middle School Section Branched to Merrill's Mail Section where public and private messages were sent and received.

Astronomy Space & Science Section Branched to Astronomy's Mail Section where public and private messages were sent and received.

Discipline/Classroom Management Section Branched to a section where public and private messages were sent and received in the area of discipline and/or classroom management.

New User Introductions Branched to a section where new users "introduced" themselves. The introductions usually included the name of the user, the school or educational institution they are associated with and their area of concentration.

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 illustration of the public mail menu is shown in Figure 2. A brief description of each command will be described separately in the following paragraphs. An example of a public message is shown in Figure 3.

```
------------------------------------------------------------
==================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 2. 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.

Exit to Main Menu Allows users to return to the main menu of the system.

```
Msg. #7403 in **CLASSROOM MANAGEMENT** Posted on 09/20/90 at 08:57:25
To: ALL   From: JAN TUCKER
Subject: DISCIPLINE
WE HAVE A STUDENT THAT ACTS OUT IN THE CLASSROOM AND IS WELL AWARE OF HIS
BEHAVIOR.  THE TEACHER HAS KEPT HIM IN FROM RECESS AND AFTER SCHOOL AS A
MEANS OF DICIPLINE.  THIS HAS NOT WORKEED. WE HAVE DISCUSSED WORKING WITH
THE PARENTS ON TAKING AWAY HOME PRIVILEGES BUT THE PARENT WILL NOT FOLLOW
THROUGH OR BE CONSISTENT (WHICH IS PROBABLY WHY WE ARE SENDING THIS IN THE
FIRST PLACE). THE STUDENT IS INTELLIGENT BUT CHOOSES NOT TO FOLLOW RULES
OR COMPLETE ASSIGNMENTS.  ANY SUGGESTIONS OUT THERE?
D>elete, R>eply, N>ext C>ontinuous (D,R,N,C)? _
```

Figure 3. Example of public message on the EEE

Teachers' Private Mail The Private Mail Section contained messages that were sent from one user on the EEE to another. An

illustration of the Private Mail Menu is shown in Figure 4. This is followed by a brief description for each command. An example of a private message is illustrated in Figure 5.

```
------------------------------------------------------------
==================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 4. 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.

Exit to Main Menu Allows users to return to the main menu of the system.

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.

```
Msg. #1067 in **PRIVATE MESSAGES** Posted on 11/03/90 at 15:27:06
To:XXXXXXXXXXX (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
guided practice, or tell me what you are learning, then show me that you
know how to do it.

D>elete, R>eply, N>ext (D,R,N)? _
```

Figure 5. Example of private message on the EEE

Data Analysis

In order to answer the research questions, descriptive statistics were calculated from the data on the surveys. These statistics included

frequency counts, means and standard deviations for the data on each question. A t-test was performed to examine the statistical significance of the difference in users of the system over time. The purpose for addressing these questions was to gain information to explore the early adopter's use of the Electronic Educational Exchange as a communication device.

Summary

The purpose of the study was to obtain data on the characteristics the early adopters of the Electronic Educational Exchange. In this study, information was collected to explore the early adopter's use of the Electronic Educational Exchange as a communication device . More specifically, an instrument was developed to collect information to provide a better understanding of early adopter's usage of the EEE and how it has progressed over time; adopter's perceptions of the EEE as a communication device; and characteristics of early adopters opposed to non adopters of the system. The chapter began with a description of the sample involved in the study and the instruments that were utilized to collect the data. Next, a description of the system was presented. This section included example messages from the EEE, and illustrations of the EEE menus. The chapter concluded with a discussion on the plans for data analysis.

CHAPTER IV. RESULTS

In this chapter, data pertaining to each of the research questions are reported. Frequency tables, descriptive statistics, and the t-test procedure were used to summarize the information. The data were obtained from the questionnaire described in Chapter III. Early adopters of the Electronic Educational Exchange completed the questionnaire. The survey pertained to subject characteristics; amount of contact outside their place of employment; frequency of use of various media; attitudes toward technology; risk and fatalism; attitude toward their use of the EEE; content of their messages; with whom they communicate on the EEE; and their initial and present perception of the EEE.

In some cases, several likert items relate to a particular category. In these cases, frequency data on each item are reported and in addition, a new variable is formed by summing responses on individual items and dividing by the number of items. Statistics on these variables are reported in separate tables; throughout the chapter, these variables are referred to as combined scores. In order to perform the computation, data were recoded so that a low number always represented a positive response.

Research Question 1 (User Characteristics):

What are the characteristics of the early adopters of the EEE?

Demographic information pertaining to the early adopters' gender, age, years of experience, income, education, current position, grade level of instruction, and subject area was collected in the survey. A frequency count is reported for each of the demographic items (Table 2).

As reported in Table 2, 51.7% of the EEE early adopters were males and 48.3% were females. Early adopters ages ranged from 23 to 68. Thirteen (45.2%) of the early adopters were in the age group 31 to 40. Almost half (48.3%) of the early adopters had eleven or more years of experience in the field of education and seven reported 0 years of experience. The subjects reporting "0" years of experience were ISU graduate students, ISU undergraduate students and first year teachers. Income of the early adopters encompassed a wide range, although the majority (55.2%) of early adopters placed themselves in an income bracket of more than $30,000. The wide variety of incomes can be partially explained by the variation in years of experience. The education levels ranged from bachelors to doctorate degrees. The majority (62%) of the early adopters possessed at least a Masters Degree. About thirty-four percent of the users surveyed were classroom teachers. The majority (47.4%) of the teachers held a position in an elementary or middle school in the area of mathematics, science, computer science, English, foreign language, social sciences, media, health, and reading.

In addition to basic demographic characteristics, the survey included items on early adopter characteristics pertaining to participation in educational organizations, professional development, contact outside of the school, use of media, attitude toward technology, risk and fatalism. These sections of the questionnaire asked the respondents to list educational organizations they have been associated with during the past two years; share goals for professional development; estimate how often they contacted various educators outside of their school; how many times in a typical semester they used various forms of media; and to reveal their agreement level to questions related to their attitude toward technology, risk and fatalism.

Contact outside of the school was evaluated on a likert scale. The scale included: 1) Very Often (more than 9 times) 2) Often (3-8 times) 3) Sometimes (1-2 times) and 4) Never. Questions on amount of contact outside of school revealed some interesting characteristics of the early adopters. Fourteen (48.3%) of the early adopters reported having contact with teachers outside of the school but within the school district "Very Often" or more than nine times a semester. In addition, eighteen (62.1%) of the early adopters reported having contact with teachers outside of the school district at least three times a semester and twenty (68%) reported attending educational conferences three or more times a semester (Table 3). The response to contact outside of school indicated that the early adopters are an

active group, communicating with several people in various circumstances.

When response on all four items measuring the contact outside of school were combined, the mean score was 2.13 (Table 4). This summary statistic indicated that in general the early adopters were contacting people outside their school frequently. Item data reported in Table 3 indicate that the early adopters contacted teachers outside of their school but within their district most frequently (1.89) and that they contacted AEA personnel least frequently (2.26). It should be noted, however, that the average scores for each of the items were within the "often" range and that respondents can be characterized as educators who are interacting frequently with others outside their school.

Use of technology was evaluated on a scale ranging from 1-5. The scale included: 1) 15 or more 2) 7 to 14 times 3) 3 to 6 times 4) 1 to 2 times and 5) Never. The response to use of technology indicated that overall, the early adopters use various forms of media frequently in their profession. Among the most common media used were educational magazines and computers. Twelve (41.4%) reported using educational magazines 15 or more times a semester and twenty-one (71.4%) respondents reported using a computer 15 or more times a semester (Table 5).

When responses from all eleven items measuring the typical amount of media use during a typical semester were combined; the

mean score was 2.82 (Table 6). The statistic indicated that the early adopters used eleven forms of media from 3 to 8 times a semester each. Educational magazines and computers produced the highest averages (1.96 and 1.40); and flannel boards were the medium used the least averaged 4.70 (Table 5).

The subjects were also questioned about their attitude toward technology. The categories of agreement were rated on a likert scale. The scale included: 1 = Strongly Agree, 2 = Agree, 3 = Undecided, 4 = Disagree, and 5 = Strongly Disagree. Seventeen (58.6%) of the early adopters chose "Disagree" as their response to the statement "I avoid using technology whenever I can"; twenty-one (71.4%) subjects responded "Strongly Agree" to the statement "I enjoy learning how to use new technologies"; and nineteen (65.5%) responded "Strongly Agree" that "Technology can make learning fun" (Table 7). Overall, the early adopter's communicated a very positive attitude toward technology.

The combined summary statistic for "Attitude toward Technology" produced a mean of 1.35 (Table 8). This further illustrated the positive attitude of the early adopters toward technology.

Questions on early adopters attitude toward risk revealed an interesting characteristic about the early adopters. Seventeen (58.6%) of the early adopters responded "Strongly Agree" to the statement "Risk is a necessary part of any business, and it's necessary to take

risks to be successful, and twenty-seven (93.1%) subjects responded between "Agree to Strongly Agree" to the statement "Today people must risk trying new things if they want to stay competitive" (Table 9). Overall, the early adopter's indicated that risk is a necessary element in their lives.

When responses on all three items measuring attitude toward risk were combined, the mean score was 1.97 (Table 10). This summary statistic reinforced the interpretation that early adopters agreed that risk was necessary to be successful and competitive. All three item average scores fell between the strongly agree and agree points on the likert scale (Table 9).

Questions pertaining to fatalism indicated that the early adopters were undecided about their feelings towards the subject. Fifteen (51.7%) of the early adopters responded "Undecided" to the statements "Many people get into trouble because they take too many chances", "People like me have very little chance of protecting our personal interests when they are in conflict with those of strong interest groups" and "To a great extent my life is controlled by accidental happenings (Table 11). Thus, the majority of the respondents chose "Undecided" to 3 of the 5 statements on fatalism.

When responses on all five items measuring fatalism were combined, the score was 2.83 (Table 12), further illustrating the respondents neutral attitude toward fatalism. Recall that the

respondents were asked to rate each statement on the likert scale "Strongly Agree" to "Strongly Disagree".

In summary, the average early adopter of the Electronic Educational Exchange can be described as:

1. possessing at least a Master Degree
2. having an income of $30,000 or more
3. working as a classroom teachers
4. being approximately 39 years old
5. having 11 or more years in the field of education
6. contacting teachers outside of their school frequently
7. using various forms of media frequently
8. having a positive attitude toward technology
9. having an attitude that risk is necessary in life
10. having a neutral attitude about fatalism

Research Question 2 (User Characteristics):

How do the users of the system perceive the system?

What was their initial perception of the system compared to their current perception?

The survey collected information on the early adopters initial and current perceptions of the Electronic Educational Exchange. Characteristics of the system were evaluated on a likert scale. The likert scale included: 1 = Very High, 2 = High, 3 = Average, 4 = Low,

and 5 = Very Low. The frequencies, means, standard deviations, and the perceptions used to evaluate the EEE are listed in Tables 13 and 15. An additional variable; called "combined perception" was calculated by summing each of the perception categories in Tables 14 and 16 and dividing by 5. Values, percentages, averages and standard deviations are presented in Tables 14 and 16 for the combined initial and current perceptions. A t-test was utilized to determine the statistical significance of the difference between the initial and current perceptions; the results for the t-tests are shown in Table 17.

Categories on the initial and current perceptions about the Electronic Educational Exchange revealed users' perceptions of characteristics of the system. When responses to the initial five characteristics were combined, the average score was 2.41. This summary statistic indicated that in general early adopters of the EEE initially perceived the system's ability as being between average and very high.

Item data reported in Table 13 indicate that the early adopters rated the triability of the system highest (2.24) and that they rated the observability of the system the lowest (2.69). However, all characteristics were rated between average and very high with a very small difference between the highest and lowest scores (.45).

Current perceptions towards the EEE were combined, also. When the responses on all five characteristics were combined, the

and 5 = Very Low. The frequencies, means, standard deviations, and the perceptions used to evaluate the EEE are listed in Tables 13 and 15. An additional variable; called "combined perception" was calculated by summing each of the perception categories in Tables 14 and 16 and dividing by 5. Values, percentages, averages and standard deviations are presented in Tables 14 and 16 for the combined initial and current perceptions. A t-test was utilized to determine the statistical significance of the difference between the initial and current perceptions; the results for the t-tests are shown in Table 17.

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Current perceptions towards the EEE were combined, also. When the responses on all five characteristics were combined, the

mean score was 1.92. This summary statistic suggests that in general early adopters of the system currently rate it between high and very high. Item data reported reveals that relative advantage and triability were ranked the highest (1.86) and compatibility was ranked the lowest (2.00). It should be noted, however, that the average scores for each of the characteristics were ranked between high and very high with a small deviation in the means from highest to lowest (.14).

The mean for the combined initial perception was 2.41, whereas them mean for the current perception was 1.92. This change indicates that participants were more positive about the system after using it for a period of time. A t-test was used to determine the statistical significance of this difference (Table 17). Results show that the difference is significant at the .001 level. Thus, participants evaluated the EEE significantly more positively after having used the system for a period of time.

Research Question 3 (Usage):

What usage patterns have evolved?

Has the frequency of use changed over time?

What caused the frequency to change over time?

Open ended questions were used on the survey to allow the early adopters to describe their use of the system. The subjects were asked to compare/contrast their current use of the system to their initial use

of the system (See Appendix J). In addition, they were asked if their frequency had changed over time and "If yes, why?" (See Appendix K). The results of the question "Has your frequency of use changed over time?" are summarized in Table 18.

Item data revealed that twenty-two (75.9%) of the early adopters have changed their frequency of use. Frequency of use both increased and decreased among the early adopters. The majority of reasons given for a decrease in use were: 1) too busy, 2) does not fit needs and 3) inaccessible. The reasons listed for an increase in the system were: 1) know more people on the system, 2) easier to communicate with ISU faculty, and 3) accessibility.

Research Question 4 (Interactions):

What are the most frequent educational topics addressed on the EEE?

With whom do the interactions occur?

System messages were read and analyzed, and six categories of messages were established. The early adopters were asked to rate their use of each category on a likert agreement scale. Results show that users rated personal issues and educational technology issues as their most used categories (Table 19). Seventeen (58.6%) of the early adopters responded "Agree" to the category "Curriculum Matters" and twenty-three (78.2%) of the early adopters responded "Agree to

Strongly Agree" to the category "Personal Issues". In addition, the survey asked, in an open ended format, "Please describe the educational topics you address on the EEE" and "With whom do you communicate the most on the EEE? Why?" (See Appendix L and M). Teachers, Iowa State faculty and graduate students were the users most commonly communicated with on the EEE, according to the open ended responses (see Table 20). The media specialist, and the system operator, were also mentioned. According to the early adopters, the most common topics addressed on the EEE were research, teaching ideas, educational technology, classroom management and personal messages.

Summary

In order to answer the research questions, statistics were calculated from the data on the surveys. The research questions included the following topics: early adopter characteristics for the EEE, early adopter's initial and current perceptions of the system, usage of the system and interactions on the EEE. The source of the data and the statistics that were computed were presented for each research question.

Table 2. Early Adopter Characteristics

Characteristic	N	Frequency	Percentage
Gender	29		
Male		15	51.7%
Female		14	48.3%
Age	29		
21 - 25		4	13.8%
26 - 30		2	6.9%
31 - 35		7	23.8%
36 - 40		6	21.4%
41 - 45		2	6.9%
46 - 50		5	17.0%
51 - 55		1	3.4%
56 - 60		1	3.4%
61 - 65		0	0.0%
66 - 70		1	3.4%
Years of Experience	29		
0		7	24.1%
1-3		4	13.8%
4-6		1	3.4%
7-10		3	10.3%
11 and over		14	48.3%
Income	29		
Under $20,000		7	24.1%
$20,000 - $24,999		2	6.9%
$25,000 - $29,999		4	13.8%
$30,000 - $34,999		10	34.5%
$35,000 or more		6	20.7%

Table 2. Early Adopter Characteristics (continued)

Characteristic	N	Frequency	Percentage
Education	29		
BA/BS		5	17.2%
BA/BS + 15		6	20.7%
MS		5	17.2%
MS + 15		7	24.1%
PhD/EdD		6	20.7%
Current Position	29		
Student Teacher		2	6.9%
1st Year Teacher		1	3.4%
Teacher		10	34.5%
Graduate Student		5	17.2%
ISU Faculty		4	13.8%
Other		7	24.1%
Grade Level	21		
Elementary School		5	23.8%
Middle School		5	23.8%
High School		3	10.3%
Specialist		2	6.9%
Administrator		1	3.4%
Other		5	17.2%
Subject Area	21		
Math/Science/Comp Science		4	13.8%
Engl/Foreign Lang/Social Sci		5	17.2%
Ind Tech/Home Arts/Business		0	0.0%
Art/Physical Education/Music		1	3.4%
Other		11	37.9%

Table 3. Early Adopter's Amount of Contact Outside of School per Semester

Category	N	Resp.	Freq.	%	Mean	S.D.
Contact with teachers outside of the school but within the school district.	27					
		1	14	48.3%	1.89	1.05
		2	4	13.8%		
		3	7	24.1%		
		4	2	6.9%		
Contact with teachers outside of the school district.	28					
		1	10	34.5%	2.11	1.03
		2	8	27.6%		
		3	7	24.1%		
		4	3	10.3%		
Contact with AEA personnel.	27					
		1	8	27.6%	2.26	1.06
		2	8	27.6%		
		3	7	24.1%		
		4	4	13.0%		
Attend educational conferences	28					
		1	5	17.2%	2.18	.819
		2	15	51.7%		
		3	6	20.7%		
		4	2	6.9%		

1 = Very Often (more than 9 times) 3 = Sometimes (1-2 times)
2 = Often (3-8 times) 4 = Never

Table 4. Early Adopter's Average Contact Outside of School per Semester

Value	Freq.	%	Mean	S.D.
1.00	2	6.9%	2.13	.881
1.25	6	20.7%		
1.75	6	20.7%		
2.00	2	6.9%		
2.25	2	6.9%		
2.75	2	6.9%		
3.00	2	6.9%		
3.25	2	6.9%		
3.50	2	6.9%		
4.00	1	3.4%		

Table 5. Early Adopter's Use of Technology per Semester

Category	N	Resp.	Freq.	%	Mean	S.D.
Educational Magazines	27	1	12	41.4%	1.96	1.06
		2	7	24.1%		
		3	5	17.2%		
		4	3	10.3%		
Television Programs	27	1	5	17.2%	3.22	1.34
		2	2	6.9%		
		3	6	20.7%		
		4	10	34.5%		
		5	4	13.8%		
Newspapers	27	1	5	17.2%	2.82	1.21
		2	5	17.2%		
		3	9	31.0%		
		4	6	20.7%		
		5	2	6.9%		
Motion Media	27	1	6	20.7%	2.59	1.86
		2	7	24.1%		
		3	7	24.1%		
		4	6	20.7%		
		5	1	3.4%		
Computers	27	1	21	72.4%	1.40	.797
		2	1	3.4%		
		3	5	17.2%		
Still Photography	27	1	5	17.2%	3.26	1.40
		2	1	3.4%		
		3	10	34.5%		
		4	4	13.8%		
		5	7	24.1%		

1 = 15 or more
2 = 7 to 14 times
3 = 3 to 6 times
4 = 1 to 2 times
5 = Never

Table 5. Early Adopter's Use of Technology per Semester (continued)

Category	N	Resp.	Freq.	%	Mean	S.D.
Audiotape	27	1	1	3.4%	3.70	.953
		2	1	3.4%		
		3	8	27.6%		
		4	12	41.4%		
		5	5	17.2%		
Flannel Boards	27	1	1	3.4%	4.70	.869
		3	1	3.4%		
		4	2	6.9%		
		5	23	79.3%		
Wall Bulletin Boards	27	1	2	6.9%	3.16	1.24
		2	8	27.6%		
		3	4	13.8%		
		4	9	31.0%		
		5	4	13.8%		
Overhead Projectors	27	1	12	41.4%	2.04	1.13
		2	5	17.2%		
		3	8	27.6%		
		4	1	3.4%		
		5	1	3.4%		
Duplicated Worksheets	27	1	12	41.5%	2.27	1.40
		2	3	10.3%		
		3	5	17.2%		
		4	4	13.8%		
		5	2	6.9%		

1 = 15 or more
2 = 7 to 14 times
3 = 3 to 6 times
4 = 1 to 2 times
5 = Never

Table 6. Early Adopter's Average Use of Technology per Semester

Value	Freq.	%	Mean	S.D.
1.09	1	3.4%	2.82	.653
1.91	1	3.4%		
2.00	1	3.4%		
2.27	1	3.4%		
2.36	2	6.9%		
2.55	1	3.4%		
2.64	3	10.3%		
2.73	3	10.3%		
2.82	3	10.3%		
2.91	1	3.4%		
3.00	1	3.4%		
3.09	1	3.4%		
3.18	1	3.4%		
3.36	2	6.9%		
3.55	1	3.4%		
3.64	1	3.4%		
3.73	1	3.4%		
4.36	1	3.4%		

Table 7. Early Adopter's Attitude toward Technology

Question	N	Resp.	Freq.	%	Mean	S.D.
Technology improves my productivity.	29	4	3	10.3%	4.90	.310
		2	6	20.7%		
I avoid using technology whenever I can.	29	1	17	58.6%	1.52	.738
		2	10	34.5%		
		3	1	3.4%		
		4	1	3.4%		
I sometimes feel intimidated when I have to use technology.	29	2	6	20.7%	4.07	1.16
		4	9	31.0%		
		5	14	48.3%		
I enjoy learning how to use new technologies.	29	1	21	72.4%	1.28	.455
		2	8	27.6%		
I look forward to a time when technology is widely used.	29	1	19	65.5%	1.38	.561
		2	9	31.0%		
		3	1	3.4%		
I feel very negative about technology in general.	29	4	5	17.2%	4.83	.384
		5	24	82.8%		
Technology can make learning fun.	29	1	19	65.5%	1.35	.484
		2	10	34.5%		

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

Table 8. Early Adopter's Attitude toward Technology (Combined Variables)

Value	Freq.	%	Mean	S.D.
1.00	10	34.5%	1.35	.363
1.14	4	13.8%		
1.29	3	10.3%		
1.43	3	10.3%		
1.57	3	10.3%		
1.71	1	3.4%		
1.86	2	6.9%		
2.00	2	6.9%		
2.14	1	3.4%		

Table 9. Early Adopter's Attitude toward Risk

Question	N	Resp.	Freq.	%	Mean	S.D.
Risk is a necessary part of any business, and it's necessary to take risks to be successful.	29	1	17	58.6%	1.52	.738
		2	10	34.5%		
		3	1	3.4%		
		4	1	3.4%		
It's foolish to take unnecessary risks in life.	29	1	72	4.1%	3.59	1.21
		2	12	41.4%		
		3	2	6.9%		
		4	72	4.1%		
		5	1	3.4%		
Today people must risk trying new things if they want to stay competitive.	29	1	14	48.3%	1.66	.814
		2	13	44.8%		
		4	2	6.9%		

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

Table 10. Early Adopter's Attitude toward Risk (Combined Variables)

Value	Freq.	%	Mean	S.D.
1.00	2	6.9%	1.97	.697
1.25	6	20.7%		
1.50	3	10.3%		
1.75	4	13.8%		
2.00	1	3.4%		
2.25	6	20.7%		
2.50	2	6.9%		
2.75	1	3.4%		
3.00	2	6.9%		
3.25	1	3.4%		
3.50	1	3.4%		

Table 11. Early Adopter's Attitude toward Fatalism

Question	N	Resp.	Freq.	%	Mean	S.D.
Many people get into trouble becuase they take too many chances.	29					
		2	2	6.9%	3.72	.797
		3	8	27.6%		
		4	15	51.7%		
		5	4	13.8%		
People like me have very little chance of protecting our personal interests when they are in conflict with those of strong interest groups.	29					
		2	1	3.4%	3.97	.778
		3	6	20.7%		
		4	15	51.7%		
		5	7	24.1%		
To a great extent my life is controlled by accidental happenings.	29					
		3	1	3.4%	4.48	.574
		4	13	44.8%		
		5	15	51.7%		
I am usually able to protect my personal interests.	29					
		1	6	20.7%	1.97	.823
		2	21	72.4%		
		4	1	3.4%		
		5	1	3.4%		
I can pretty much determine what happens in my life.	29					
		1	8	27.6%	1.80	.559
		2	19	65.5%		
		3	2	6.9%		

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

Table 12. Early Adopter's Attitude toward Fatalism (Combined Variables)

Value	Freq.	%	Mean	S.D.
2.33	6	20.7%	2.83	.374
2.67	9	31.0%		
3.00	10	34.5%		
3.33	2	6.9%		
3.67	2	6.9%		

Table 13. Early Adopter's Initial Perceptions of the EEE

Category	N	Resp.	Freq.	%	Mean	S.D.
Relative Advantage	29	1	4	13.8%	2.31	.891
		2	15	51.7%		
		3	8	27.6%		
		4	1	3.4%		
		5	1	3.4%		
Compatibility	29	1	3	10.3%	2.31	.850
		2	17	58.6%		
		3	7	24.1%		
		4	1	3.4%		
		5	1	3.4%		
Triability	29	1	5	17.2%	2.24	.830
		2	14	48.3%		
		3	8	27.6%		
		4	2	6.9%		
Complexity	29	1	3	10.3%	2.52	.871
		2	11	37.9%		
		3	13	44.8%		
		4	1	3.4%		
		5	1	3.4%		
Observability	29	1	1	3.4%	2.69	.850
		2	12	41.4%		
		3	12	41.4%		
		4	3	10.3%		
		5	1	3.4%		

1 = Very High 2 = High 3 = Average
4 = Low 5 = Very Low

Table 14. Early Adopter's Initial Perceptions of the EEE (Combined Variables)

Value	Freq.	%	Mean	S.D.
1.40	1	3.4%	2.41	.682
1.60	3	10.3%		
1.80	2	6.9%		
2.00	3	10.3%		
2.20	6	20.7%		
2.40	2	6.9%		
2.60	4	13.8%		
2.80	2	6.9%		
3.00	4	13.8%		
3.40	1	3.4%		
4.80	1	3.4%		

Table 15. Early Adopter's Current Perceptions of the EEE

Category	N	Resp.	Freq.	%	Mean	S.D.
Relative Advantage	29	1	10	34.5%	1.86	.915
		2	16	55.2%		
		3	1	3.4%		
		4	1	3.4%		
		5	1	3.4%		
Compatibility	29	1	8	27.6%	2.00	.845
		2	15	51.7%		
		3	4	13.8%		
		4	2	6.9%		
Triability	29	1	9	31.0%	1.86	.789
		2	17	58.6%		
		3	1	3.4%		
		4	2	6.9%		
Complexity	29	1	9	31.0%	1.97	.677
		2	13	44.8%		
		3	6	20.7%		
		4	1	3.4%		
Observability	29	1	8	27.6%	1.93	.799
		2	17	58.6%		
		3	2	6.9%		
		4	2	6.9%		

1 = Very High 2 = High 3 = Average
4 = Low 5 = Very Low

Table 16. Early Adopter's Current Perceptions of the EEE (Combined Variables)

Value	Freq.	%	Mean	S.D.
1.00	1	3.4%	1.92	.476
1.20	4	13.8%		
1.60	5	17.2%		
1.80	1	3.4%		
2.00	7	24.1%		
2.20	6	20.7%		
2.40	1	3.4%		
2.60	3	10.3%		
2.80	1	3.4%		

Table 17. Early Adopter's Initial/Current Perceptions of the EEE

Perseption	N	Mean	S.D.	T	2-Tailed Probability
Initial Perception	29	2.41	.682	3.31	.001
Current Perception		1.92	.476		

Table 18. Comparison of Early Adopter's Current/Initial Frequency of Use of the EEE

Category	N	Resp.	Freq.	%	Mean	S.D.
	29					
Increase of Use		1	22	75.9%	1.21	.418
Decrease of Use		2	6	20.7%		

Table 19. Interactions: Content of Messages

Category	N	Resp.	Freq.	%	Mean	S.D.
Curriculum Matters	27	1	4	13.8%	2.30	1.07
		2	17	58.6%		
		3	2	6.9%		
		4	2	6.9%		
		5	2	6.9%		
General Educational Issues	27	1	8	27.6%	1.93	.781
		2	14	48.3%		
		3	4	13.8%		
		4	1	3.4%		
Classroom Management Techniques	27	1	3	10.3%	2.56	.974
		2	12	41.4%		
		3	6	20.7%		
		4	6	20.7%		
Educational Technology	27	1	10	34.5%	1.89	.934
		2	12	41.4%		
		3	4	13.8%		
		5	1	3.4%		
EEE System Management	27	1	3	10.3%	2.96	1.09
		2	6	20.7%		
		3	8	27.6%		
		4	9	31.0%		
		5	1	3.4%		
Personal Issues	27	1	11	37.9%	1.85	.949
		2	12	41.4%		
		3	1	3.4%		
		4	3	10.3%		

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

Table 20. Early Adopter's Frequent Interactions

Category	N	Resp.	Freq.	%	Mean	S.D.
Student Teachers	27	1	3	10.3%	3.19	1.24
		2	5	17.2%		
		3	7	24.1%		
		4	8	27.6%		
		5	4	13.8%		
1st Year Teachers	27	1	1	3.4%	3.41	1.05
		2	4	13.8%		
		3	9	31.0%		
		4	9	31.0%		
		5	4	13.8%		
Teachers	27	1	10	34.5%	1.85	.864
		2	13	44.8%		
		3	2	6.9%		
		4	2	6.9%		
Graduate Students	27	1	4	13.8%	2.27	1.07
		2	17	58.6%		
		3	2	6.9%		
		4	2	6.9%		
		5	2	6.9%		
ISU Faculty	27	1	9	31.0%	2.19	1.18
		2	10	34.5%		
		3	3	10.3%		
		4	4	13.8%		

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

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 become they face many challenges during their first year of teaching. With the contact from the teacher training institution broken and the barriers that exist 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 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. Almost all of the networks share the same purpose: linking educators together to provide group support and the opportunity to exchange information.

Although electronic networks provide a seemingly "natural" solution for teacher isolation, the adoption and diffusion of this innovation among educators has been slow. Roger's adoption/diffusion theory provides a framework to study this process and gain insight for the implementation of electronic communication networks for teachers.

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 present study provides data on the use and value of a specific electronic communication networks. Data for this study was calculated from users, considered early adopters, of the Electronic Educational Exchange (EEE), an electronic communication network attempting to "bridge the gap" between the world of practice and professors and staff Iowa State University.

In this study, the data included early adopter characteristics, initial and current perceptions of the system, usage patterns, and interactions on the EEE. The purpose of the study was to question early adopters of the Electronic Educational Exchange. More specifically, data were collected to provide a better understanding of adopter's initial and current use of the EEE; adopter's perceptions of

the EEE as a communication device; and characteristics of early adopters of the system.

The research contributed to our knowledge about early adopters' characteristics and why they used an electronic networks as a communication device. Also, the study provided insights into the evolution of the Electronic Educational Exchange. Hopefully, this study will also assist other organizations in the implementation and management of electronic communication networks.

Discussion of Results

Adopter Characteristics

Characteristics of early adopters are an important aspect of the adoption and diffusion of innovations. Therefore, one of the areas of interest in this study was the discussion of the characteristics of early adopters of the EEE. Rogers (1986) found that early adopters of innovations, such as the Electronic Educational Exchange, possess certain characteristics. In general results from this study indicate that characteristics of early adopters of the EEE are similar to Rogers' findings.

(A) Socioeconomic Status:

Education. Rogers (1983), Lionberger (1960), and other researchers agree that in general early adopters have more years of formal schooling than others in the audience of an innovation.

This study supports Rogers' in his findings that early adopters have high education levels. The study found that fifty-two percent of the early adopters possessed at least an masters degree. Most of the early adopters were classroom teachers, the fact that over half of the EEE early adopters have pursued graduate education suggests that in general these early adopters do have more years of formal schooling than typical classroom teachers.

Social Status. Social status as defined by Rogers includes a number of variables such as total wealth, job prestige, and social class level. The present study used salary as the variable to determine the early adopter's social status.

Sixty nine percent of the subjects studied reported they had an income of $25,000 or more per year. More specifically, 13.8% reported an income of $25,000 - $29,999; 34.5% fell into the $30,000 - $34,999 bracket; and 20.7% in the $35,000 or more. Considering that all respondents were educators, these salaries indicated respondents were in the "high end" of the salary scale. Among this population, the findings support Roger's adoption diffusion theory.

(B) Communication Behavior:

Social Participation. Past research on adopter characteristics has found early adopters are active members in a number of professional organizations.

The subjects were asked to report any educational organizations they have been affiliated with during the last 2 years. The average number of memberships was 3.3 per subject. This data indicated that early adopters of the EEE were characterized as professionally active. When considering the numerous challenges the field of education places on educators, this statistic firmly supports Roger's findings that early adopters are active members of professional organizations.

Mass Media Use. Innovators generally use mass media information sources more frequently than others according to previous research.

The subjects were given a list of 10 various forms of media to rate. When individual use of all the media was compiled, the data indicated that the early adopters use various forms of media 30 to 100 times in a typical semester. In addition to the frequency of media use, subjects attitude toward technology was studied. The overall attitude suggested that the early adopters feel technology improves their lives, is not intimidating but is rather enjoyable to work with and learn about, and makes life more enjoyable. Thus, the early adopters can be

characterized as a group with positive attitudes toward technology and a group who puts these attitudes into practice.

Personal Communication. Interpersonal relationships outside the local community are often positively related to innovativeness, especially in the early stages of the process of diffusion.

The study results indicated that the early adopters of the EEE had contact outside of their school, 12 to 32 times a semester. This contact included:

1. contacting teachers outside of their school but within their district
2. contacting teachers outside of the school district
3. contacting AEA personnel
4. attending educational conferences

Thus, the data suggests that early adopters of the EEE pursue interpersonal and professional relationships outside the local community, a characteristic of early adopters that Rogers identified in previous research.

(C) Personality Traits:

Attitude Toward Risk. According to Rogers (1983), venturesomeness and great willingness to bear risk are very characteristic of innovators and early adopters. "He or she desires the hazardous, the rash, and the daring and the risky" (Rogers, 1983).

The present study found the early adopters of the EEE felt risk was necessary to be successful. They felt that people must risk if they want to stay competitive. The combined average for all 3 "risk questions" was 1.97 which according to the likert scale used indicated that the early adopters "agree" firmly with the previously stated comments on risk.

Aspirations. Innovators/early adopters usually have high success goals according to previous studies of adopter categories.

Eighty nine percent of the subjects reported having set goals to enhance their professional development. The most common of those goals included:

1. obtaining an advanced degree
2. advancing in their career
3. integrating technology into the curriculum
4. publishing articles
5. improving teaching skills

Thus, it can be generalized that the early adopters of the EEE were goal oriented people. The most common goals listed by the early adopters indicate that they had relatively high professional aspirations.

Fatalism. According to Rogers, early adopters are less fatalistic than later adopters. People who believe they have some control over

their future are more likely to adopt innovations than those who believe they lack control over their fate.

When all five questions pertaining to fatalism were combined, a mean of 2.83 resulted. This indicated that the early adopters were unsure of their control over their future and ability to protect their personal interests. This statistic differs from Roger's finding. He found that early adopters believed they had control over their future. The early adopters of the EEE were undecided in this area.

In general, the results of the present study are in agreement with Rogers. In summary, the average early adopter of the Electronic Educational Exchange can be described as:

1. possessing a Master Degree or higher education
2. having an income of $30,000 or more
3. working as a classroom teachers
4. being approximately 39 years old
5. having 11 or more years in the field of education
6. contacting teachers outside of their school frequently
7. using various forms of media frequently
8. having a positive attitude toward technology
9. having an attitude that risk is necessary in life
10. having a neutral attitude on fatalism

Adopter's Perception of the System: Diffusion

According to Rogers (1986), adopters' perceptions of an innovation are also a vital element in the diffusion process. He concluded that there are five dominant characteristics that adopters use to evaluate an innovation. The characteristics include:

1. Relative Advantage
2. Compatibility
3. Triability
4. Complexity
5. Observability

The initial and current perceptions of the early adopters of the Electronic Educational Exchange were measured with respect to Rogers' categories. A significant finding in the study involved the initial and current perceptions of the Electronic Educational Exchange. The subjects were asked to rate the EEE, based on 5 categories, using a five point scale ranging from very high to very low. The mean of the initial perception was 2.41 indicating that the users felt the system ranked between average and high. Later, the subjects were asked to rate their current perception of the system. A mean of 1.92 was calculated as the current perception of the system, indicating that the users had a significantly higher perception of the EEE than when they began using the system. Overall, the data suggested that

early adopters of the EEE were receiving the services they were seeking from the system.

Message content and with whom individuals communicated was also compiled and evaluated. The subjects were asked to comment on "with whom they communicate most frequently" and "what their message content entails". The responses were similar. Teachers, Iowa State faculty, and graduate students were the most common users communicated with on the EEE. Media specialists and the system operator were also mentioned.

Message content was also similar among users; content categories included research, teaching ideas, educational technology, classroom management and personal messages. The five content areas of messages listed previously dominated the early adopters' response to "what their message content entails". This suggested that the system was being used for professional development.

Rogers documented that early adopters of innovations possessed certain qualities and that user perceptions of an innovation was a major determinant in the innovation's success rate. The current study supported Roger's findings. Early adopters of the EEE were similar to early adopters of various other innovations. User perceptions were identified by Rogers as vital elements related to success and failure of innovations. He identified 5 characteristics that an innovation must meet in order to be successful. The Electronic Educational Exchange was evaluated on these five criteria and it was found that the early

adopters had a positive initial attitude toward the EEE, but more significant was the finding that the current perception of the system was considerably higher than the initial attitude. This suggests that the EEE has the capability of accomplishing its goals of providing a convenient method for the exchange of ideas between student teachers, practicing teachers and Iowa State faculty and providing telecommunications experience for student teachers, practicing teachers, and Iowa State faculty.

The early adopters' current perceptions of the system suggested that it is providing an effective method of communication and valuable telecommunications experience for educators. Therefore, this indicated that the early adopters of the EEE will play a vital role in its diffusion process. The early adopters will serve as a filter for the network. According to Rogers (1986), if the early adopters have a poor perception of an innovation, the innovation will be filtered out of the system but if the early adopters perceive the innovation as worthy they filter the innovation through the social system.

Implications for Electronic Network Developers

Developing and implementing an electronic communication network can be a very challenging task. Based on the results of this study, the following suggestions for meeting this challenge are offered.

According to Rogers (1986), the first consideration when designing a system is how the potential users will perceive it. More specifically, the perceptions developers should be concerned with are:

> Relative Advantage - the degree to which an innovation is perceived as being better than the idea it supersedes. The relative advantage of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.
> Compatibility - the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of the receivers. The compatibility of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.
> Triability - the degree to which an innovation may be experimented with on a limited basis. The triability of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.
> Complexity - the degree to which an innovation is perceived as being relatively difficult to understand and use. The complexity of a new idea, as perceived by members of a social system, is negatively related to its rate of adoption.
> Observability - the degree to which the results of an innovation are visible and easily communicated to others. The

observability of a new idea, as perceived by members of a social system, is positively related to its rate of adoption.

The present study revealed an increase from the early adopter's initial to current perception of the EEE's relative advantage. Thus, the early adopter's presently view the system's relative advantage as very high opposed to their initial perception of high. This indicated that the system was seen by the users as an efficient and effective manner of communication. It also suggested that the system was more beneficial to the early adopters than they had initially thought it would be.

Network developers must convince all potential users that the new method of communication will be advantageous to them both personally and professionally. The relative advantage of an electronic communication system may be increased by developing conferences, promoting the values of the system and the educators with whom participants may communicate.

The second perception, compatibility, is concerned with the needs and values of the target audience. The early adopters of the EEE had an initial perception of about the middle of the scale, the current perception of High (2.00) was more positive, but not significantly so. An electronic network must meet the needs of the participants in order to stimulate interest on them so they will use the system. Network developers need to stress the convenience of integrating use

of the system into educator's individual schedule. Electronic networks operate 24 hours a day, so participants can log onto the system when it fits into their personal schedule. Developers should also stress the network's capability to provide public and private mail. Also, personal experiences with electronic communication networks must be considered. Have the potential participants been users of a network that failed or that did not meet their needs? If so, the developer must persuade the potential user(s) that the system will be compatible to their current needs and then a network that meets these goals must be provided.

Triability is the third user's perception the current study examined. An increase of .38 was found suggesting that the early adopter's present perception of the system's triability increased from high to very high on the agreement scale. A network should be set-up so users can experiment with the system without feeling threatened. After the users first access of the system, it may still take some encouragement to get them to continue to use the network. Methods of encouragement may be:

- contacting the individual via phone or letter,
- visiting the individual and/or the institution in which they are employed,
- creating a network newsletter to be sent to all users.

User friendliness is the key to the fourth user perception, complexity. Early adopters of the EEE considered the system to be

considerably less complex in their final evaluation compared to their initial perception. It is important that the user feel they are capable of understanding and using the system. Also, if the system is too complex users may become discouraged by their failure to operate the system and not adopt. The first consideration when designing a system is complexity. It must be easy for people with little computer experience to use. The system should be "menu driven" and the options available should be fairly intuitive to the user. It is also important for the telecommunications software that is used to connect with the host to be user friendly. The software should have the ability to store the phone number of the network and dial it with the push of a single key.

Once users are "on-line", it is essential for the users to be able to access the system conveniently. Therefore, it is necessary for users to have convenient access to hardware that will enable them to connect with the host computer. This may require visits to the user's sites by the network developers to ensure that the necessary equipment is installed and functioning correctly. If this is not done, 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 making the system observable. The observability of the EEE increased substantially from the initial to the final evaluation. Initially users perceived the system's observability as average to high (2.69).

Their final perception was significantly higher. The observability was rated high to very high (1.93).

System developers must be willing to contact educators, make visits to schools or educational setting, present the system to groups of educators and continue this process to ensure the system will continuously attract new users.

In conclusion, system developers need to exhibit the advantages of the new communication device, focusing on the needs of the audience and the value of the system to the potential users. It is important that the network be user friendly allowing the users to experiment with the network in a nonthreatening environment. Also, the network must be observable to the target audience to initiate and diffuse usage of the system.

Rogers (1986) stated that early adopters of innovations possess certain characteristics and the present study supports his findings. In general, the study found early adopters of the Electronic Educational Exchange to possess these characteristics described by Rogers. Therefore, it is suggested to network developers that they individually seek individuals possessing characteristics similar to those of the early adopters of the EEE. Their use will increase the system's observability therefore, enhancing the diffusion process.

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 early adopters or heavy users of this type of innovation. This would entail determining characteristics of the users of the system, determining what motivates these people to access a network frequently, and utilize identifying how they effectively use it. use it. Also needed is research about what needs to be done to encourage nonusers to become regular users. This data will provide information about who potential users are, why they use these systems and how systems need to be used and/or operated to promote use. One approach to identifying a solution to the problem of exposing electronic communication networks might involve collecting data pertaining to the advantages and disadvantages of electronic communication networks 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 for research includes the study of 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 the characteristics of the system that may affect this 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 use decreases as the novelty of the network wears off.

Summary

Electronic communication networks are being established to address the problem of teacher isolation. In this study, information was collected about the early adopter's characteristics, perceptions, usage, and value of the Electronic Educational Exchange as a communication tool for Iowa State faculty, Iowa State graduate students, Iowa State student teachers, 1st year teachers and experienced educators. The study found that early adopters possess characteristics similar to Roger's findings about early adopters, early adopters' perceptions of the system became more positive over time, and the content of messages on the system emphasizes communication of professional topics.

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APPENDIX A. USER SURVEY FOR THE ELECTRONIC EDUCATIONAL EXCHANGE

User Survey for the
Electronic Educational Exchange

This survey is designed to examine the evolution of use of the Electronic Educational Exchange (EEE). The results of this survey will be used to improve and expand the current EEE system for present and future professionals in the field of education. Your cooperation will be greatly appreciated. The data will be kept confidential, and all survey results will be reported as group rather than individual results.

User Characteristics: The following questions pertain to individual characteristics. Using the categories given, please circle the category that best describes you.

1. Highest level of education:
a. BA/BS
b. BA/BS + 15
c. MS
d. MS + 15
e. PhD/EdD

2. Gender:
a. Female
b. Male

3. Age: _____

4. Current position:
a. Student Teacher in Spring '90 (go to question 5)
b. 1st Year Teacher during '89-'90 school year (go to question 5)
c. Teacher (go to question 5)
d. Graduate Student (go to question 7)
e. ISU Faculty (go to question 7)
f. Other (please specify area here: _____)

5. Grade level you are currently teaching
a. Elementary School
b. Middle School
c. High School
d. Specialist
e. Administrator
f. Other (please specify here: _____)

6. What subject area do you teach?
a. math/ science/ computer science
b. English/ foreign language/ social sciences
c. industrial technology/ home arts/ business
d. art/ physical education/ music
e. other (please specify area here: _____)

7. Years of professional experience in the field of education:
a. 0
b. 1-3
c. 4-6
d. 7-10
e. 11 and over

8. Which income category below best estimates your average personal gross income per year?
a. Under $20,000
b. $20,000 - $24,999
c. $25,000 - $29,999
d. $30,000 - $34,999
e. $35,000 or more

Please circle the response below that best represents how often you engage in the activities listed in a typical school year. Please **circle** only one and **do not mark between the letters**.

	Very Often (more than 9 times)	Often (3-8 times)	Sometimes (1-2 times)	Never
9. Contact teachers outside of my school but within my school district	VO	O	S	N
10. Contact teachers outside of my school district	VO	O	S	N
11. Contact AEA personnel	VO	O	S	N
12. Attend educational conferences	VO	O	S	N

Below is a list of educational tools you may use professionally and/or in your classroom during instruction. Please **circle** the response that best represents your use of each tool in a typical semester.

	15 OR MORE	7 to 14 TIMES	3 to 6 TIMES	1 to 2 TIMES	NEVER
13. Educational Magazines					
14. Television Programs					
15. Newspapers					
16. Motion Media (film/videotape)					
17. Computer					

18. Still Photography

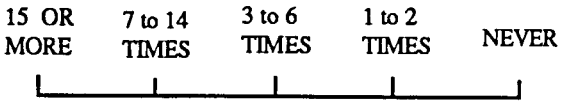
19. Audiotape

20. Flannel Boards

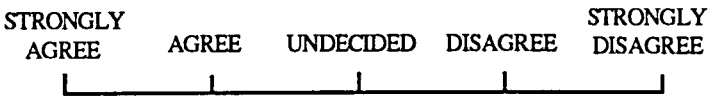
21. Wall Bulletin Boards

22. Overhead Projector

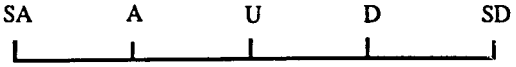
23. Duplicated Worksheets



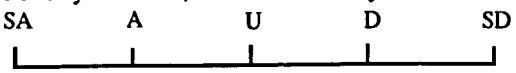
Please circle the response below that indicates your agreement/disagreement with each item. Please **circle** only one and **do not mark between the letters**.



24. Technology improves my productivity.



25. Risk is a necessary part of any business, and it's necessary to take risks to be successful.

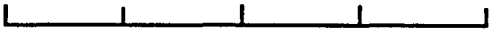


26. Many people get into trouble because they take too many chances.

SA A U D SD

27. I avoid using technology whenever I can.

SA A U D SD



28. People like me have very little chance of protecting our personal interests when they are in conflict with those of strong interest groups.

SA A U D SD

29. To a great extent my life is controlled by accidental happenings.

SA A U D SD

30. I sometimes feel intimidated when I have to use a technology.

SA A U D SD

31. I am usually able to protect my personal interests.

SA A U D SD

32. I enjoy learning how to use new technologies.

SA A U D SD

33. It's foolish to take unnecessary risks in life.

SA A U D SD

34. I look forward to a time when technology is more widely used.

SA A U D SD

35. Today people must risk trying new things if they want to stay competitive.

SA A U D SD

36. I feel very negative about technology in general.

SA A U D SD

37. Technology can make learning fun.

SA A U D SD

38. I can pretty much determine what happens in my life.

SA A U D SD

Interactions: The following questions pertain to interactions of the EEE as a communication device for you. Circle the response below that indicates your agreement/disagreement with the items. Please **circle** only one and **do not mark between the letters**.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE

39 - 44
I use the EEE to communicate with educators about:

	SA	A	U	D	SD
39. curriculum matters					
40. general educational issues					
41. classroom management techniques					
42. educational technology					
43. EEE system management					
44. personal issues					

45 - 50
I use to the EEE to contact:

	SA	A	U	D	SD
45. student teachers					
46. 1st year teachers					
47. teachers					
48. graduate students					
49. ISU faculty					
50. Other (Please specify _____)					

Usefulness: The following questions pertain to the usefulness of the EEE as a communication device for you. Circle the response below that indicates your agreement/disagreement with the items. Please **circle** only one and **do not mark between the letters**.

STRONGLY AGREE — AGREE — UNDECIDED — DISAGREE — STRONGLY DISAGREE

51. The EEE facilitates my communication with student teachers
SA A U D SD

52. The EEE facilitates my communication with first year teachers
SA A U D SD

53. The EEE facilitates my communication with teachers
SA A U D SD

54. The EEE facilitates my communication with ISU faculty
SA A U D SD

55. The EEE facilitates my communication with ISU graduate students
SA A U D SD

56. I benefit from increased interaction with educators on the EEE.
SA A U D SD

57. The EEE helps me feel less isolated as a professional
SA A U D SD

58. The EEE allows me to receive suggestions and help from other educators
SA A U D SD

59. The EEE has been beneficial to my professional development
SA A U D SD

60. My experience with the EEE has encouraged me to use telecommunications in my teaching
SA A U D SD

In the following two sections you will be asked to rate your initial and present perceptions with respect to the following 5 characteristics of the EEE. In items 61 - 65 you will rate your initial perception of the system and in items 66 - 70 you will rate your current perception of the system. The characteristics that you will be asked to rate are listed and defined below. Rate the degree to which the EEE has each characteristics.

Relative Advantage - the degree to which an innovation is perceived as being better than the idea it supersedes.

Compatibility - the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of the receivers.

Triability - the degree to which an innovation may be experimented with on a limited basis.

Complexity - the degree to which an innovation is perceived as being relatively easy to understand and use.

Observability - the degree to which the results of an innovation are visible and easily communicated to others.

Please **circle** only one and **do not mark between the letters**.

VERY HIGH — HIGH — AVERAGE — LOW — VERY LOW

61 - 65
Initial Perception You Had of the EEE.

VH H A L VL

61. Relative Advantage

VH H A L VL

62. Compatibility

VH H A L VL

63. Triability

VH H A L VL

64. Complexity

VH H A L VL

65. Observability

66 - 70
Current Perception You Have of the EEE.

Relative Advantage - the degree to which an innovation is perceived as being better than the idea it supersedes.

Compatibility - the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of the receivers.

Triability - the degree to which an innovation may be experimented with on a limited basis.

Complexity - the degree to which an innovation is perceived as being relatively easy to understand and use.

Observability - the degree to which the results of an innovation are visible and easily communicated to others.

Please **circle** only one and **do not mark between the letters**.

VERY HIGH | HIGH | AVERAGE | LOW | VERY LOW

66. Relative Advantage — VH H A L VL

67. Compatibility — VH H A L VL

68. Triability — VH H A L VL

69. Complexity — VH H A L VL

70. Observability — VH H A L VL

Please write a short answer to each of the following questions.

71. Within the past two years, have you been a member of any educational organizations?
a. yes
b. no

Please list the organization(s) and your position in the organization .

72. Have you set specific professional goals for your professional development?
a. yes
b. no

If yes, please list them below.

73. Please compare/contrast your current amount of use of the system to when you initially became a user of the EEE.

74. Has your frequency of use changed over time? _____ yes _____ no

If yes, why?

75. Please describe the educational topics you address on the EEE.

76. With whom do you communicate the most on the EEE? Why?

APPENDIX B. PART ONE OF QUESTIONNAIRE

8. Which income category below best estimates your average personal gross income per year?
a. Under $20,000
b. $20,000 - $24,999
c. $25,000 - $29,999
d. $30,000 - $34,999
e. $35,000 or more

Please circle the response below that best represents how often you engage in the activities listed in a typical school year. Please **circle** only one and **do not mark between the letters**.

	Very Often (more than 9 times)	Often (3-8 times)	Sometimes (1-2 times)	Never
9. Contact teachers outside of my school but within my school district	VO	O	S	N
10. Contact teachers outside of my school district	VO	O	S	N
11. Contact AEA personnel	VO	O	S	N
12. Attend educational conferences	VO	O	S	N

Below is a list of educational tools you may use professionally and/or in your classroom during instruction. Please **circle** the response that best represents your use of each tool in a typical semester.

	15 OR MORE	7 to 14 TIMES	3 to 6 TIMES	1 to 2 TIMES	NEVER
13. Educational Magazines					
14. Television Programs					
15. Newspapers					
16. Motion Media (film/videotape)					

	15 OR MORE	7 to 14 TIMES	3 to 6 TIMES	1 to 2 TIMES	NEVER
17. Computer					
18. Still Photography					
19. Audiotape					
20. Flannel Boards					
21. Wall Bulletin Boards					
22. Overhead Projector					
23. Duplicated Worksheets					

Please circle the response below that indicates your agreement/disagreement with each item. Please circle only one and do not mark between the letters.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE

24. Technology improves my productivity.

SA A U D SD

25. Risk is a necessary part of any business, and it's necessary to take risks to be successful.

SA A U D SD

26. Many people get into trouble because they take too many chances.

SA A U D SD

27. I avoid using technology whenever I can.

SA A U D SD

28. People like me have very little chance of protecting our personal interests when they are in conflict with those of strong interest groups.

SA A U D SD

29. To a great extent my life is controlled by accidental happenings.

SA A U D SD

30. I sometimes feel intimidated when I have to use a technology.

SA A U D SD

31. I am usually able to protect my personal interests.

SA A U D SD

32. I enjoy learning how to use new technologies.

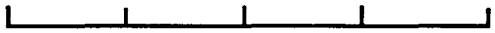
SA A U D SD

33. It's foolish to take unnecessary risks in life.

SA A U D SD

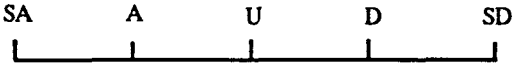
34. I look forward to a time when technology is more widely used.

SA A U D SD



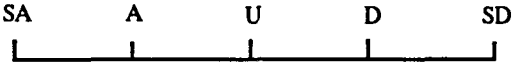
35. Today people must risk trying new things if they want to stay competitive.

SA A U D SD



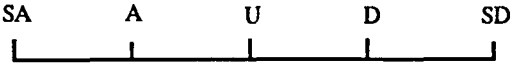
36. I feel very negative about technology in general.

SA A U D SD



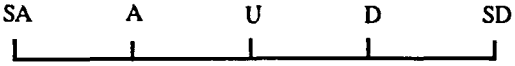
37. Technology can make learning fun.

SA A U D SD



38. I can pretty much determine what happens in my life.

SA A U D SD



APPENDIX C. PART TWO OF QUESTIONNAIRE

Interactions: The following questions pertain to interactions of the EEE as a communication device for you. Circle the response below that indicates your agreement/disagreement with the items. Please circle only one and do not mark between the letters.

STRONGLY AGREE — AGREE — UNDECIDED — DISAGREE — STRONGLY DISAGREE

39 - 44
I use the EEE to communicate with educators about:

39. curriculum matters — SA A U D SD
40. general educational issues — SA A U D SD
41. classroom management techniques — SA A U D SD
42. educational technology — SA A U D SD
43. EEE system management — SA A U D SD
44. personal issues — SA A U D SD

45 - 50
I use to the EEE to contact:

45. student teachers — SA A U D SD
46. 1st year teachers — SA A U D SD
47. teachers — SA A U D SD
48. graduate students — SA A U D SD
49. ISU faculty — SA A U D SD

	SA	A	U	D	SD
50. Other (Please specify _____)					

APPENDIX D. PART THREE OF QUESTIONNAIRE

Usefulness: The following questions pertain to the usefulness of the EEE as a communication device for you. Circle the response below that indicates your agreement/disagreement with the items. Please circle only one and do not mark between the letters.

STRONGLY AGREE	AGREE	UNDECIDED	DISAGREE	STRONGLY DISAGREE

51. The EEE facilitates my communication with student teachers

SA A U D SD

52. The EEE facilitates my communication with first year teachers

SA A U D SD

53. The EEE facilitates my communication with teachers

SA A U D SD

54. The EEE facilitates my communication with ISU faculty

SA A U D SD

55. The EEE facilitates my communication with ISU graduate students

SA A U D SD

56. I benefit from increased interaction with educators on the EEE.

SA A U D SD

57. The EEE helps me feel less isolated as a professional

SA A U D SD

58. The EEE allows me to receive suggestions and help from other educators

SA A U D SD

59. The EEE has been beneficial to my professional development

SA A U D SD

60. My experience with the EEE has encouraged me to use telecommunications in my teaching

SA A U D SD

APPENDIX E. PART FOUR OF QUESTIONNAIRE

In the following two sections you will be asked to rate your initial and present perceptions with respect to the following 5 characteristics of the EEE. In items 61 - 65 you will rate your initial perception of the system and in items 66 - 70 you will rate your current perception of the system. The characteristics that you will be asked to rate are listed and defined below. Rate the degree to which the EEE has each characteristics.

Relative Advantage - the degree to which an innovation is perceived as being better than the idea it supersedes.

Compatibility - the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of the receivers.

Triability - the degree to which an innovation may be experimented with on a limited basis.

Complexity - the degree to which an innovation is perceived as being relatively easy to understand and use.

Observability - the degree to which the results of an innovation are visible and easily communicated to others.

Please **circle** only one and **do not mark between the letters**.

VERY HIGH — HIGH — AVERAGE — LOW — VERY LOW

61 - 65
Initial Perception You Had of the EEE.

61. Relative Advantage — VH H A L VL

62. Compatibility — VH H A L VL

63. Triability — VH H A L VL

64. Complexity — VH H A L VL

65. Observability — VH H A L VL

66 - 70
Current Perception You Have of the EEE.

Relative Advantage - the degree to which an innovation is perceived as being better than the idea it supersedes.

Compatibility - the degree to which an innovation is perceived as being consistent with the existing values, past experiences and needs of the receivers.

Triability - the degree to which an innovation may be experimented with on a limited basis.

Complexity - the degree to which an innovation is perceived as being relatively easy to understand and use.

Observability - the degree to which the results of an innovation are visible and easily communicated to others.

Please **circle** only one and **do not mark between the letters**.

VERY HIGH — HIGH — AVERAGE — LOW — VERY LOW

66. Relative Advantage — VH H A L VL

67. Compatibility — VH H A L VL

68. Triability — VH H A L VL

69. Complexity — VH H A L VL

70. Observability — VH H A L VL

APPENDIX F. RESEARCH QUESTIONS FOR PART FIVE OF QUESTIONNAIRE

1. What are the characteristics of early adopters of the EEE?

3. What usage patterns have evolved?

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

APPENDIX G. PART FIVE OF QUESTIONNAIRE

Please write a short answer to each of the following questions.

71. Within the past two years, have you been a member of any educational organizations?
a. yes
b. no

Please list the organization(s) and your position in the organization .

_____

_____

_____

_____

_____

72. Have you set specific professional goals for your professional development?
a. yes
b. no

If yes, please list them below.

_____

_____

_____

_____

_____

73. Please compare/contrast your current amount of use of the system to when you initially became a user of the EEE.

_____

_____

_____

_____

_____

74. Has your frequency of use changed over time? _____ yes _____ no

If yes, why?

75. Please describe the educational topics you address on the EEE.

76. With whom do you communicate the most on the EEE? Why?

APPENDIX H. HUMAN SUBJECTS COMMITTEE APPROVAL FORM

Information for Review of Research Involving Human Subjects

Iowa State University

(Please type and use the attached instructions for completing this form)

1. Title of Project: Perceptions and Characteristics of Early Adopters of an Electronic Network for Educators

2. I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are protected. I will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I agree to request renewal of approval for any project continuing more than one year.

Julie Hamilton	9/4/90		
Typed Name of Principal Investigator	Date	Signature of Principal Investigator	

Professional Studies	N031 Lagomarcino Hall	294-6840
Department	Campus Address	Campus Telephone

3. S ivators

	Date	Relationship to Principal Investigator
	9-4-90	Major Professor

RECEIVED SEP 5 1990 ISU GRADUATE COLLEGE

4. Principal Investigator(s) (check all that apply)
☐ Faculty ☐ Staff ☒ Graduate Student ☐ Undergraduate Student

5. Project (check all that apply)
☒ Research ☒ Thesis or dissertation ☐ Class project ☐ Independent Study (490, 590, Honors project)

6. Number of subjects (complete all that apply)
30 # Adults, non-students 5 # ISU student ___ # minors under 14 ___ # minors 14 - 17 ___ other (explain)

7. Brief description of proposed research involving human subjects: (**See instructions, Item 7.** Use an additional page if needed.)

(Please do not send research, thesis, or dissertation proposals.)

8. Informed Consent:
☐ Signed informed consent will be obtained. (Attach a copy of your form.)
☒ Modified informed consent will be obtained. (See instructions, item 8.)
☐ Not applicable to this project.

APPENDIX I. COVER LETTER

September 17, 1990

Dear EEE Participant:

I am a graduate student in the department of Professional Studies in Education at Iowa State University in Ames, Iowa. To satisfy the requirements for a Master's of Science Degree in Curriculum and Instructional Technology, I am conducting research under the supervision of Dr. Ann Thompson.

You have been selected to complete this survey due to your extensive use of the system during the spring of 1990. The results of this survey will be used to improve and expand the current EEE system for present and future educators.

The study will explore adopter's use of the Electronic Education Exchange as a communication device. More specifically, it will collect information to provide a better understanding of adopters' use of the EEE and how it has progressed over time; adopter's perceptions of the EEE as a communication device; and characteristics of early adopters.

An identification number has been assigned to the survey sent to you. The numbers will allow me to check your name off the mailing list when the questionnaire is returned. The completed survey will not be associated with your name.

The survey can conveniently be completed within 20 minutes; however, it is your option to abstain from participating in this research study. Please return the survey in the return postage paid envelope within a week, whether you choose to complete the survey or not.

I feel my research can make a significant contribution in the area of electronic communication networks and more specifically the Electronic Education Exchange. The responses you express are highly valued and appreciated. I would be pleased to furnish you with additional information at your request.

Respectfully,

Julie Hamilton,
Graduate Student

Ann Thompson,
Professor
(515) 294-6840

Enclosure

APPENDIX J. OPEN ENED RESPONSE #1

73. Please compare/contrast your current amount of use of the system to when you initially became a user of the EEE.

I feel more comfortable with the system but always take the time to log in

I used the system about once every week when I first began. Now, I only use it about once a month. Mainly because I'm really busy right now.

I cannot currently use it. Every time I try, I get a "no carrier" message. Have not been able to get through since June! I would like to use it, but was disappointed by the lack of response to my messages.

A little less because I am very busy now.

I have used it less lately because I've been very busy.

I use the system more now than initially. This is due to several factors: 1) learning the system, 2) making contacts with other teachers, 3) availability of equipment. After I found out what the system was capable of and could do for me I used it more often.

About the same.

I haven't hooked up yet because of the busy first weeks of school. I will begin using the system daily during the fourth week of September. I used the system daily last year.

Similar, since I was a "believer" at the time. I used it heavily at first.

My use has continued to be periodic, consistent, and to meet my on going needs for convenient communication.

I feel more comfortable with the system yet don't always take the time to login.

About the same - 2-4 times a week

Usage has increased somewhat

I use it less now because there is not presently what I consider to be a "critical mass" of users on the system. I use the EEE for e-mail but seldom post public message anymore because no one is reading them so why should I waste my valuable time doing public posts?

I actually use it less due to the objectives of the EEE, the user base, and the inability to up and download.

When I first started I was afraid to use it I stay away from it. But now I don't ever hesitate to use it. I love it. What a great way to communicate.

I check the EEE on a daily basis.

I haven't used the EEE as much recently because there seems to be a smaller number of people on. I would really like to see files that could be downloaded and uploaded. We would contribute. My son is a senior in high school registered at ISU next year. He would like access.

It has been increased.

I think I may have used the system more when I first became a user because of the novelty of the system. I think my sue decreased substantially for a period and them picked up and leveled off.

Less now since I've had to run between Ames and Boone

My use has steadily increased as has the circle of people with whom I communicate.

50% increase

Don't have any other system.

APPENDIX K. OPEN ENDED RESPONSE #2

74. Change of frequency:

Because I've been really busy.

See answer to question 73
I use it less now because there is not presently what I consider to be a "critical mass" of users on the system. I use the EEE for e-mail but seldom post public message anymore because no one is reading them so why should I waste my valuable time doing public posts?

I have "connected" with more people.

Became easier to use when available in office on modem. Personal access increases use

Because I've been busy lately.

The same reasons given in 73.
I use the system more now than initially. This is due to several factors: 1) learning the system, 2) making contacts with other teachers, 3) availability of equipment. After I found out what the system was capable of and could do for me I used it more often.

The EEE system - the computer is not available. It's not placed in public place so that you can access easily.

Declined slightly (yet this was due to being a former sysop initially)

Time governs frequency/week. but I don't think overall average has changed.

Nature of objectives and users of the EEE. Also, not every user logs on and/or responds.

The number of messages in the public mail -- I enjoy reading them and responding

It is a friendly user system.

Because it isn't always efficient for me to log on to communicate when I can see these I need to speak with. Also, the novelty wore off. However, it is a good way to communicate certain information to those I see regularly.

To busy solving minor problems

time limitation on my part

Too busy lately

Continual usage by others and increase of participation by teachers in my school district. Macintosh made modem work easier.

I have increased my usage.

The E-mail has become a part of our club communication system. Very effective and appreciated. I hope others are finding the astronomy public mail useful.

APPENDIX L. OPEN ENED RESPONSE #3

75. Please describe the educational topics you address on the EEE.

Schedules in music (days per week for choir, etc)
Musicals
Salary schedules
Insurance in master contract

Educational technology related issues

Classroom management
Ideas for classroom teaching
Social responsibility
district issues

Time management
discipline
Like to find out more about these topics plus cooperative learning strategies.

Curriculum topics usually technology oriented.

Mostly internal communication (ISU)

Unit information
Behavior/Discipline

Research directions
Specific plans for "educational" projects.
Encouragement/criticism of current "ed" projects.

I will start using it again to try to collect information on subject areas where I don't have very much Material.

Marked earlier on these sheets.

Readier of public messages
Communicate w/one ISU staff member (Dr. Thompson)
Share areas of concern and interest of other teachers

Discipline
Middle School

Use of technology in classroom
general discussion re: education
friends in educational technology

lesson ideas
computer use in different curriculum areas
ICUE - communication

I have a minority program with the Science Department at ISU. We talk about the details of the program, and ISU contacts my kids with questions of enrichment for them to answer.

Mostly private communications with other club officers - new memberships, meetings, etc.

astronomy
space science
science education

Technology integration
classroom management
thesis writing
current events in education

curriculum decisions
technology ideas
unit plan ideas
ideas for seminars, symposiums, from classroom teachers

Discuss with other computer and math teachers what they teach and what they use for technology.

telecommunications software
news programs for schools (CNN Newsroom, Channel One)
automated circulation systems for media centers
state standards for library media centers
new computer products
discipline ideas/techniques
educational conferences

Discuss research project
general greeting
request educational materials
ask teaching techniques questions

Integration of technology into education
Research topics in technology

Teachers mail

Computerization of media centers
Student management
Resources
Professional development
AEA services

APPENDIX M. OPEN ENED RESPONSE #4

76. With whom do you communicate the most on the EEE? Why?

Other media specialists - similar interests.

Ames teachers to share ideas.
Hard to communicate with others I don't know where they teacher or what area they are in.

ISU faculty and grad assistants - related to research projects.

ISU graduate students/faculty/other university faculty. The reason is to ask teaching methods, research projects, and personal greetings.

Other teachers and media specialists = share ideas and information, notice of upcoming meetings, socialize

The system operator - she's a good friend of mine. That's how I found out about the system.

Ann Thompson - as major professor for Ph.D.
Inga Smith - liason w/national teachers of the year
Student teachers - answering questions for their specific programs

graduate students
colleagues at a distance - it's convenient
new teachers

The officers of the Ames Area Amateur Astronomers who are on the system. E-mail is a handier communications tool than writing letters or using the telephone.

Astronomy club members or other interested subscribers.

Dr. Bernie Gerstein. Head of my program.

Ann Thompson - ICUE and ISU
Julie Hamilton - ISU and system operator

ISU staff and grad students

Other teachers - Sioux City is pretty far removed from the university.

Other teachers in my school district

Why?

- We mutually decided to check in regularly to compare notes and ideas.
- The system is easy to use.
- The good level of usage seems to be people who are in transition (ie. student teachers) and a few months later they are gone so that the consistent usage is directed toward other classroom teachers who log on regularly.

Other teachers - general information

Science club members - to keep abreast of what was happening.

Friends - often times I see them but don't have a chance to say what's on my mind.
Professors - EEE is a good way to communicate "little details" of a project that I may have forgotten to bring up in formal meetings or face-to-face interactions.

Graduate students
ISU faculty

I communicated the most with a grad student (Julie Hamilton) because she is a good friend of mine who was always willing to give me advice and suggestions during my student teaching experience. This benefitted me greatly as it made me feel more secure with my decisions.

Dr. T because she is easily "accessed" that way.

Other graduate students, professors, AEA personnel.
Set up meetings, ask for location of various materials needed, class topics.

I'm looking to communicate with anyone who is willing to share ideas. I'm looking for opinions on new/current issues and their reasoning.

Other teachers-

Because it is important for us to share ideas and concerns.

Major professor - obvious
Sysop

Other teachers -
We share common goals