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UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

E-MENTORING: A CASE STUDY OF THE VIABILITY AND BENEFITS OF ELECTRONIC MENTORING WITH BEGINNING TEACHERS IN RURAL SCHOOLS

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

by

Sheila Kay Brintnall

Norman, Oklahoma

2002

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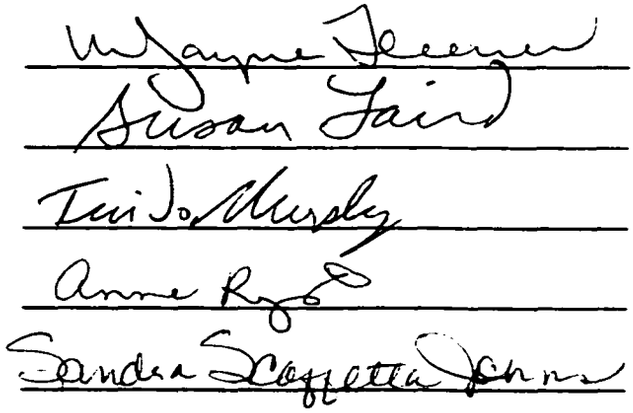
A DISSERTATION
APPROVED FOR THE DEPARTMENT OF
INSTRUCTIONAL LEADERSHIP AND ACADEMIC CURRICULUM

BY



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ABSTRACT

E-mentoring was designed to help early career teachers make the transition from student to teacher, particularly those in a rural setting. By using on-line mentoring with a group of former classmates and acquaintances the need to establish initial bonds was eliminated and it was hoped that the group would be able to enter more quickly into the process of providing support and teaching suggestions to each other. Analyses indicated that the participants were reluctant to question or criticize the other group members' responses. It became necessary for the facilitator to provide discussion topics throughout the entire project. The weekly e-mail responses were archived and became the primary data source. Additional data such as, initial and exit interviews, a group interview, classroom observations, and a beliefs survey were also collected. After the group meeting, all contact among the participants was via e-mail. Both female participants reported that they felt the need for more face-to-face contact which raised the question of the gender neutrality of e-mentoring. All the participants reported the main benefit they received from the project was the realization that each of the other participants was struggling with similar problems and issues. While only one participant reported having any feelings of isolation in his or her teaching situation at the beginning of the study, all the participants related feeling less isolated as a result of participating in this project.

CHAPTER ONE

INTRODUCTION

The end of the twentieth century ushered in a new age quickly dubbed the information age. With the advent of new technologies, like personal computers, networks, and the Internet, people have access to unlimited information resources. The sheer volume of data, facts, or information that a person can access is seemingly endless. The virtually unlimited capabilities of computers to organize and store data and the ease of access to this information prompted the use of the term information age to describe our new reliance on and need for organizing and making sense of the proliferation of information as information technologies have competed with and over-come traditional economies and commerce in the last part of the twentieth century. With the development of electronic-mail (e-mail) people are able to communicate with anyone on the planet who is on-line. The applications and uses of the Internet and e-mail are many and growing as the technology is becoming more powerful and accessible.

Perhaps one of the greatest uses of the Internet and e-mail is for communication. The term "global village" is often used to indicate the seeming shrinkage of distance due to the rapid flow of material on the information super highway. "We can communicate electronically with people on the other side of

the world as easily as we might have a conversation with a neighbor" (Long & Long, 2001, I9). The power of the Internet to traverse the distances of time, space, and culture can perhaps be put to use to connect beginning teachers as they struggle with difficult classrooms, new curricula, pressures of accountability, isolation, and their own developmental issues as early career teachers.

Isolation

Few studies have examined the possible use of e-mail to support early career teachers in rural settings. Rural schools often lack resources, including teachers, to offer a rich and diverse curriculum. Isolation may be a factor for educators in rural settings that can be addressed by emerging technologies.

> The American Heritage Dictionary contains the following definition:
>
> **i•so•late** (ī ′sə-lāt′) *tr. v.* **-lated, -lating, -lates. 1.** To separate from a group or whole and set apart. **2.** To place in quarantine. **3.** *Chem.* To obtain (a substance) in an uncombined form. **4.** To render free of external influence; insulate, — *adj.* (-lĭt, -lāt′). Solitary, alone (DeVinne, 1982, p. 680).

Isolation is a common feeling for people who live in rural settings. There is the physical isolation in the sheer distance one has to travel to reach basic necessities such as stores, restaurants, and hospitals, and there is also an emotional isolation if one is new to the community. Learning the history and prior relationships of people in a small community takes time. Making acquaintances and becoming a part of a rural community can be difficult. One must become acculturated in the

community before acceptance can take place.

Similarly, isolation is a common feeling for early career teachers in a rural school. Again there is a physical isolation. Frequently in small schools there is only one teacher per subject area so the new teacher is isolated from peer teachers in the same curricular area. Also for the beginning teacher there can be an emotional isolation since there is a loss of the contacts one had at the university and forming new friendships in a school community that already has established relationships can be difficult.

E-mentoring

Since time, as well as space, is also a crucial factor in feelings of isolation, and travel time to meetings or even to work can make efforts for direct communication and networking more of a burden than facilitative or supportive of early career teachers, other means of networking often must be explored. Hoping to provide maximum assistance and minimum burden to the beginning teachers while achieving my goal of supplying a new avenue of support for them, I came up with the idea of an on-line peer mentoring project. This project involved setting up a communication system for beginning teachers associated with the rural university where I work. The approach was to offer an on-line peer mentoring service, referred to as e-mentoring throughout this paper, for early career teachers from our university. I hoped that through the use of e-mentoring

we would be able to overcome the obstacles of space and time inherent in rural teaching positions and be able to provide support for these teachers. The germ of the idea came from work done by Elayne Weger.

Weger (1998) studied various support options given to four rural middle school mathematics teachers. One of the teachers in her study struggled with a variety of difficulties. In an attempt to provide on-going support, Weger added her to the inner school e-mail list she maintained. Weger noted "It was through e-mail that we continued to trade ideas and information over the next year" (Weger, 1998, 19). E-mail became an effective way for Weger to provide support for this teacher. Since e-mail effectively eliminates distance, whether it is the distance across a school building or across several counties in rural northwestern Oklahoma, I hoped it would also be a productive way for me to provide support for beginning rural teachers.

Proposed Study

I invited four beginning teachers to participate in an on-line peer mentoring project. The teachers selected were in their first or second years of teaching, graduates from our program, and mathematics or science majors. They all had teaching positions in rural school systems within a two hundred mile radius of the university. Demographically, the participants formed a diverse group. There were two mathematics teachers and two science teachers; two male and two female

teachers; two entry year and two second year teachers; two teachers who had participated in or were currently involved in an entry year program and two who had not participated in an entry year program. However, all the participants came from Northern Oklahoma or South Central Kansas, three of the four were raised in nuclear family settings with the remaining participant's parents being divorced. Two of the participants grew up in the same town as each other, and all of the participants were from rural towns so they had many similar experiences to shape their belief systems. The size of the schools in which they were teaching ranged from 100 to 1200 students; the size of the communities where they lived ranged from 2000 to 17,500 people. Two of the school systems were in small rural towns isolated from any major populated areas; one of them was in a rural town within 20 miles of a large urban town; and one of the them was a in a large rural community within 30 miles of a large urban town. One of the teachers was the only teacher in his field at the school; two of the teachers were one of two teachers in their subject area; and one of the teachers was one of three teachers in her subject area. Surprisingly the teacher in the school with two colleagues teaching in the same content area was not the teacher from the largest school.

The group members all had access to e-mail either at school, at home or both; this was essential for participation in the study since the majority of the project consisted in responding to e-mail from the other group members. The project was designed to see if a community could be formed via the Internet to

help alleviate feelings of isolation that many beginning rural teachers have. The premise was that by limiting participation to recent graduates from the same rural university they would already know each other or have the basis for shared experiences in their backgrounds, and the initial steps of community building would have taken place. The focus could therefore be on how they used the internet for support, building on prior shared experiences and backgrounds as the basis for initial feelings of trust and comfort.

Research Question

The question explored by this study was: What is the impact of e-mentoring on early career teachers in terms of curriculum support, teaching support, emotional support, and reflective activity?

Significance of the Investigation

The on-line peer mentoring program described above is unique to any other on-line mentoring program found described in the research literature. The design of the project described here was constructed to encourage collaborative problem solving, reflection and discourse about teaching among peers rather than the one-on-one mentoring that often occurs in face-to-face interactions in institutionalized induction programs. The most significant difference from other on-line mentoring programs is that this one is a peer mentoring program. Other on-line mentoring

programs involve one mentor and one mentee leaving the traditional power ratio in place. This project attempts to overcome traditional power relations so the participants in this study could become more directive and reflective in pursuing their development needs and more confident that their problems and ideas have merit and value.

The program is similar, however, to Project NExT though not as encompassing. Project NExT is a program for recent Ph.D. graduates in mathematics who have a strong interest in the teaching of undergraduate mathematics. The program consists of group meetings, speakers, and a web site (http://archives.math.utk.edu/projnext/) that provides classroom materials and listservs to facilitate communications among participants. There is a difference between my project and project NExT; namely that, a facilitator was used in the study described here to provide the members with direction and to give them access to a knowledgeable educator should they feel the need for support.

The need for a program such as this is evidenced in the high number of early career teachers leaving the field. The National Center for Education Statistics reports that "One in five 1992-93 bachelor's degree recipients who started teaching after college had left the profession without returning by 1997" (NCES, 2000). In a news release on their web-site www.nea.org, the National Education Association (August 30, 2001) states that within the first three years of their teaching careers about 20% of new teachers leave the profession. Teacher

attrition in rural Oklahoma schools is even worse. In "Oklahoma Educator Supply and Demand Study: September 1998" the Southern Regional Education Board (SREB) reports that from 1993 - 1996 37% of new teachers either exited the profession or moved from the district (SREB, 1998). Of the six people that I originally asked to be a part of this study, two declined. One in the middle of his second year of teaching was resigning to accept a job in the private sector, and the other also in her second year of teaching felt too overwhelmed to take on any more responsibilities. She seemed to be exhibiting signs of job burnout. Clearly, if we are to keep good teachers in the classroom, we must support them early in their careers. E-mentoring may be one way to do that.

Overview of Remaining Chapters

The remainder of this dissertation provides an in depth description of the e-mentoring project that four beginning teachers and I engaged in during the spring semester of the 1999-2000 academic year. Chapter 2 examines the literature and establishes the position of my study. Chapter 3 provides a detailed description of the project, the participants, and the methodology of the study. The findings of the data collected are described in Chapter 4. The paper concludes with a discussion of the results and suggestions for further research in Chapter 5.

CHAPTER TWO

LITERATURE REVIEW

The project described in this paper is an e-mentoring program developed to support early career teachers in rural teaching situations. Rural education systems have a unique set of needs (Bull & Hyle, 1990; Collins, 1999; and Yeo, 1998) which can cause beginning teachers entering these settings to feel especially vulnerable (Harris & Collay, 1990; Hersh, Stroot, & Snyder, 1993; Thoresen, 1997). Mentoring and induction programs in the traditional form of one mentor working with one mentee can provide support to the beginning teacher (Ballantyne & Hansford, 1995; Odell & Ferraro, 1992; and Wildman, Magliaro, Niles & Niles, 1992). However, naturally occurring peer-mentors may be more affective (Corbett & Wright, 1993; Hansen & Matthews, 1994; McDougall & Beattie, 1998; and Tellez, 1992).

The need to develop support programs for early career teachers is established by statistics from the National Center for Educational Statistics (NCES) (1997) and the National Commission on Teaching and America's Future (NCTAF) (Darling-Hammond, 2000) which show high attrition rates of early career teachers and predict large teacher shortages within the next decade.

Current technology offers the ability to update the old idea of mentoring

and to make it more accessible to teachers in rural areas where distance can prevent other programs from working (Anderson, 1998; Owens, 1999; Thomas & Clift, 1996; Thoresen, 1997; and Wittenburg & McBride 1998). Caution must be used when implementing e-mail usage into a mentoring program because communication via e-mail can allow users to hide behind the anonymity of it and result in overly harsh or critical messages (Federico & Bowley, 1996 and Trumfio & Keenan, 1994) and misunderstandings can occur due to an over-reliance on the written word (Stell, 1999). However, e-mail communication can also promote in depth discussions (Overbaugh, 1998) and foster creativity (Federico & Bowley, 1996). This paper discusses a project that used communication via e-mail to mentor four early career teachers in rural settings who had established relationships prior to the beginning of the study.

Teacher Attrition

Early career teacher attrition is a significant problem for school systems (Banks, 1999; Colbert and Wolf, 1992; Henke, Xianglei, and Geis, 2000). One out of five beginning teachers in 1992-93 left teaching within the first three years. (Henke, Xianglei, and Geis, 2000). The NCES (1997) has published data that show the second highest percent (9.1%) of teachers exiting the profession are those with three years of experience or less. The highest percent (11.1%) of exiting teachers have twenty-five or more years of experience and are presumably

retiring. Additionally, Education World (2000) reports on their web-page www.education-world.com, about 40% of students trained as teachers never enter the profession.

Of the beginning teachers that leave education, Henke, Xianglei, and Geis (2000) report that the teachers who had received more pedagogical training and who had participated in induction programs were less likely to leave the profession. Specifically, they give the following break-down by percentage of teachers leaving the education field: (1) 15% of teachers who had student taught left the profession compared to 29% who had not, (2) 14% of certified teachers left compared to 49% of uncertified teachers, (3) 15% of teachers who participated in an induction program compared to 26% who did not participate in such a program (Henke, Xianglei, and Geis, 2000). Education World (2000) echoes the findings of Henke, Xianglei, and Geis. A report on their web-site states that 30% of teachers trained in a traditional curriculum will leave teaching in their first three years. This is compared with 15% of those who complete a five-year education program and 60% of those who participate in alternative programs who leave the profession within three years.

Colbert and Wolff (1992) note that frequently the most inexperienced teachers are assigned to the most demanding classes and often are given inadequate support. Henke, Xianglei, and Geis (2000) report a quarter of the beginning teachers leaving education did so because they were not interested in or

dissatisfied with teaching. NCES (1997) reports in "Job Satisfaction Among America's Teachers" that teachers rated administrative support and leadership among their top working conditions that promote job satisfaction. Employees with high job satisfaction tend to have low attrition rates (NCES, 1997). In a report entitled "Young Teachers Flee the Profession," the NEA notes that mentoring is one way to provide administrative support. Mentoring programs with an intensive on-the-job-training approach are having success in lowering teacher attrition rates in participating school districts (NEA, 2001). Adding new mentoring programs or adapting existing programs may be one way rural schools can lower beginning teacher attrition rates.

Rural Education

The needs of rural education and educators have been overlooked and ignored for decades (Collins, 1999). Rural school systems have their own set of problems with teacher recruitment and retention. Attrition rates tend to be higher in rural areas(Collins, 1999). In rural Oklahoma schools the SREB (1998) reported that 37% of new teachers either exited teaching or moved from the district in which they were teaching. The American Association of School Administrators (1999) cites the main problem facing rural school districts as the ability to recruit and retain quality teachers.

Up to this point it has commonly been thought that if an idea or innovation

worked in a large city public school then it should work equally well in the smaller rural schools. This ideology is being challenged as the realization is made that rural schools are not just miniaturized urban schools. Rural schools are populated with students from diverse economic and social backgrounds, are located in areas with polarized populations of young working poor and fixed income retirees, and are frequently forced to conform to standards developed for urban schools (Yeo, 1998). Rural communities also have access issues that limit opportunities for technical and/or high paying corporate jobs and economic successes made available to individuals in suburban and urban communities. The motivation for education therefore is limited. According to the NCES (1997), children in rural areas are less likely to perceive the value of higher education, participate less frequently in higher education opportunities, and have a lower high school completion rate than students in suburban settings.

Rural schools have problems beyond the demographic and economic ones noted above. It has proven difficult for rural schools to recruit and retain qualified teachers, especially beginning teachers fresh from universities (Collins, 1999; Harris & Collay, 1990). While teacher education programs require course work in multiculturalism to prepare future teachers for urban educational systems, few, if any, require prospective teachers to study about the needs peculiar to rural education (Herzog, 1998). Adapting to the culture of the community can be challenging to those not initiated in rural life. One of the most common

complaints from beginning teachers in rural areas is of isolation both professional and social (Collins, 1999; Hersh, Stroot, & Snyder, 1993; Thoresen, 1997).

An additional concern for rural school systems is the predicted teacher shortage in the next decade. The NCTAF (Darling-Hammond, 2000) reports that the United States will need an additional 2 - 2.5 million teachers in the next decade. The NCES (1999) estimates the need for 2 million new teaching hires by 2006. The rising demand is due in part to retirement, increased teacher attrition, and expanding enrollments. The SREB (1998) predicts the demand in Oklahoma to be highest in rural areas.

Universities need to start addressing the differing needs of rural education in an effort to prepare students for rural teaching positions to meet the predicted upcoming needs (Collins,1999). While research has shown the teachers that are most likely to stay in rural placements are the ones who came from rural areas, these teachers still need preparation particular to those settings (Bull & Hyle, 1990). It is highly likely that to meet the needs of beginning teachers in rural areas new strategies for educational support will need to be developed by universities. These approaches must accommodate the distance obstacle inherent in rural education and must help alleviate the feelings of isolation that many beginning teachers express (Collins, 1999). One method that is currently being used to support beginning teachers is mentoring.

Mentoring and Induction Programs

Mentoring programs have been suggested as possible solutions to the problem of beginning teacher attrition and have public support behind them (Wildman, Magliaro, Niles, & Niles, 1992). School systems find mentoring worthwhile since it allows experienced teachers to be rewarded, sometimes monetarily, for sharing their knowledge and experience. Mentoring also provides an easy way to acculturate beginning teachers into their institution (Ballantyne & Hansford, 1995).

Beginning teachers report positively on their mentoring experiences citing the most valuable aspect as emotional support (Odell & Ferraro, 1992). However, in depth studies show that when they have problems or questions it is not from their assigned mentors that they seek help (Marso, 1990; Tellez, 1992). More commonly, beginning teachers establish networks of teachers with whom they are comfortable and bring their problems to them. If mentoring is to be successful, Tellez (1992) argues, teacher educators must encourage students to seek out naturally occurring mentoring and support mechanisms.

The work of Corbett and Wright indicates that a mentor need not be an experienced teacher. Mentors who have only recently completed their training were just as successful at mentoring, if not more successful, as their experienced counterparts (Corbett & Wright, 1993) possibly indicating that peers may make affective mentors. The idea of peer mentoring has existed for a while although

not much research has been conducted in this area of mentoring (Harnish & Wild, 1994).

Hansen and Matthews (1994) are proponents of peer mentoring. They note, "The case for peer mentoring is primarily one of organizing a professional relationship with others for professional growth" (Hansen & Matthews, 1994). Peer mentoring neutralizes the power ratio in place in traditional mentoring relationships (Harnish & Wild, 1994). McDougall and Beattie (1998) have found peer mentoring to be useful in continuing professional development programs. They describe peer mentoring as "meeting with a respected colleague on a regular basis and sharing experiences, ideas and concerns. It involves engaging honestly in reflective practice" (McDougall & Beattie, 1998).

Keele and DeLaMare-Schaefer (1984) note that informal interaction among peers frequently develops on its own and can lead to "the creation and dissemination of instructional innovation among faculty." Boreen and Niday (2000) noting the successes of naturally occurring informal peer mentoring relationships recommend that peer mentoring groups be artificially generated in order to take advantage of its benefits. They also note in their study, however, that some "preservice teachers may not sense the need for or feel as comfortable developing a peer-mentor relationship via e-mail" (Boreen & Niday, 2000). Some of the reasons the students were not as comfortable with the e-mail experience included limited access to technology, extended correspondence time, and the

desire for an immediate answer (Boreen & Niday, 2000). Harnish & Wild (1994) write that many positive outcomes were discovered during their study of peer mentoring. They found those participating in a peer mentoring program showed improvement in their instruction methods, had professional growth, and elevated student-faculty interaction which ultimately increased the learning and success of students (Harnish & Wild, 1994). Peer mentoring is a promising type of mentoring that warrants further research (Hansen & Matthews, 1994).

While mentoring may help to reduce attrition rates in rural school systems, another difficulty also needs to be addressed. Distance is a problem indigenous to rural education settings. Often, rural schools are several miles from a university. Long travel time makes it inconvenient for beginning teachers to have frequent meetings with university faculty members to discuss classroom management techniques, professional development activities, or curriculum concerns. Rural schools tend to have small faculties so the possibility is high that a beginning teacher will be the only teacher in his or her field. The ability to contact another teacher in the same teaching field can be restricted by distance since many rural schools are several miles apart. One way to overcome the distance issue inherent to rural teaching positions is to use on-line methods of communication.

Electronic Communications

Electronic mail or e-mail was first introduced in 1972 (*Internet Timeline*,

2000), but was not widely used by the general public until the mid 1990's when user-friendly interfaces were developed for the Internet (*Internet Timeline*, 2000). E-mail offers a different means of communicating. It has the advantage over other means of communication of being fast and cheap (Berke, 1999). It removes the pressure of face-to-face confrontation encouraging users to be more open (Trumfio & Keenan, 1994). E-mail is asynchronous communication, allowing participants to respond at their leisure and not requiring communicants to coordinate their times of communication. E-mail can also be more deliberate and encourage reflection as the e-mail message is edited and revised before sending and the received message can be re-read and deliberated upon before a response is sent.

However, some argue that the lack of face-to-face contact makes e-mail less personal and causes people to be reluctant to use it (Federico & Bowley, 1996) and even those who support the use of e-mail note that while users are more free with their responses they can send blunt or overly harsh messages (Trumfio & Keenan, 1994). Misunderstandings due to over-reliance on only the written word can also occur. No tonal inflection or syllable emphasis is transmitted with e-mail messages. Stell (1999) suggests using "emoticons" — like :-) for smile — to display the writer's tone.

Much research has been done on the willingness of faculty and students to use e-mail. Faculty are cautious in their acceptance of e-mail as the best method

of communication with students citing lack of control over who has access to personal information being sent, increased time necessary to maintain contact, and perceived lack of user friendliness of e-mail programs as some of their main concerns (Lynch, Altschuler, & Polley, 2002; Nantz & Wilkins, 1995). When asked about their e-mail usage, students comment on accessibility issues such as account availability and access to computer facilities (Zagorsky, 1997). Both faculty member and student alike report computer illiteracy as a major drawback to e-mail usage (Nantz & Wilkins, 1995; Zagorsky, 1997).

On a more positive note, studies also report that once the physical hurdles of obtaining an account and accessing a computer and the emotional hurdles of learning to use the software are overcome, communication via e-mail can lead to more in depth academic discussions than would have occurred had more traditional methods of communication been employed (Overbaugh, 1998). E-mail can be a rapid communication method that encourages and perhaps demands in some instances two-way communication. And if basic etiquette guidelines are followed, e-mail can enhance creativity and productivity (Federico & Bowley, 1996).

On-line Mentoring Programs

Public school systems have implemented electronic communication as a means of improving communication between distant sites. Many universities are

testing the feasibility of incorporating today's technology into their teacher education programs. For example the Physical Education Department at Texas A & M University has developed an interactive web-site for their student teachers to use (http://stpe.tamu.edu). Through the web-site student teachers are able to find resources for lesson plans and classroom management tips. In addition, e-mail addresses and teaching assignments are listed for each student teacher so that any student teacher may contact any other student teacher for ideas, suggestions or moral support. The faculty also participate in the project by maintaining communication via e-mail with the student teacher and the student teacher's cooperating teacher. The student teacher web-site has proven successful, and the Physical Education Department at Texas A & M University continues to update and expand the site based on students and cooperating teachers suggestions (Wittenburg & McBride, 1998).

Several on-line mentoring programs already exist. They are primarily of two types: (1) programs in which a company employee mentors a school student (Adams, 1999; Bellinger, 1998; Hausman, 1998; Haworth, 1998; Lynn, 1993; Solomon, 2000) and (2) programs in which teachers mentor other teachers on-line (Anderson, 1998; Owens, 1999; Rogan, 1997; Thomas & Clift, 1996). An example of a program in which professionals establish mentoring relationships with students is described by Bellinger (1998). Since 1995, Hewlit Packard has been connecting members of their engineering staff with interested mathematics

and science students in the fifth through twelfth grades. The engineers are able to help the students make the connection between what they are learning in school and what they hope to one day do with their lives (Bellinger, 1998).

The majority of the on-line mentoring programs in education (Anderson, 1998; Owens, 1999; Rogan, 1997; Thomas & Clift, 1996) are designed to teach teachers how to use the Internet through peer interaction. For example Rogan (1997) describes the Montana based program *Reach for the Sky* that provides teachers with on-line learning experiences. In 1994, twenty-two teachers from fifteen different rural schools were given Internet access and on-line training in how to use the Internet. They were provided links to science and mathematics web-sites and allowed to network with other teachers. A year later each of the initial participants became mentors to four new teachers from Washington, Idaho, Oregon, Utah, or Montana. These groups, under the guidance of the mentor, completed at least one on-line course designed to introduce the teachers to the Internet (Rogan, 1997). Thus, teachers taught teachers on-line about how to use the Internet.

A few school systems, however, have implemented on-line mentoring programs. For example, Thoresen (1997) reports on school systems in Montana and Ohio who have developed programs that involve the mentoring of entry year teachers in rural areas over the Internet. Both programs are similar in nature to the study reported here. In Ohio, four school districts in one county wrote a joint

grant and received funding for a county-wide mentor. The mentor was in charge of "buddy teachers" who were assigned to each entry year teacher. The entry year teacher had access to the "buddy teacher" and the county-wide mentor, and all participants involved had access to a computer network for communication and resources. In Montana, each new teacher was assigned a mentor that he or she could contact using e-mail because of distance problems. The participants responded positively to the program with both mentors and mentees reporting that they learned from their respective partners (Thoresen, 1997). In both programs extensive use was made of electronic communication, however, in each case the power hierarchy was kept in tact with each new teacher being assigned to a particular experienced teacher. In the study described in this paper a group of early career teachers, including some entry year, was formed. The teachers were encouraged to look to each other for support over the Internet and not to an all-knowing facilitator.

Summary

The studies discussed in this chapter illustrate that beginning teachers need support as they begin their teaching careers and also that additional avenues of offering this backing need to be examined, especially, for early career teachers in rural areas. The capabilities and accessibility of current technology make it a likely candidate for providing support to beginning teachers.

This study took advantage of current technological capabilities to establish an e-mentoring program with several beginning teachers. The question explored by this study was: What is the impact of e-mentoring on early career teachers in terms of curriculum support, teaching support, emotional support, and reflective activity?

The following chapters contain the details of the study design, the results of the study, and the interpretations drawn by the researcher. The methodology of the study and a thorough description of the participants is given in Chapter 3. Chapter 4 contains the findings of the study, and Chapter 5 discusses the outcomes and suggests other avenues of research that need to be examined.

CHAPTER THREE

METHODOLOGY

This study was designed to determine if on-line mentoring was a viable and beneficial way to provide support to early career teachers in rural settings. Beginning teachers are especially vulnerable because of their frequent isolation, due to distance, from other beginning teachers and from other teachers in the same subject area, due to small school size (Hersh, Stroot, & Synder, 1993; Thoresen, 1997). The teachers selected to participate were in their first or second year of teaching, graduates from the same rural university, and mathematics or science education majors. They all had teaching positions in rural school systems within two hundred miles of the university from which they graduated where I am currently employed. The project was designed to see if a community could be formed via the Internet to help alleviate feelings of isolation that many beginning rural teachers have. The premise was that by limiting participation to recent graduates from the same rural university they would already know each other or have the basis for shared experiences in their backgrounds, and the initial steps of community building would have taken place. The focus could therefore be on how they used the Internet for support, building on prior shared experiences and backgrounds as the basis for initial feelings of trust and comfort.

The primary data sources were their e-mail responses; additionally, pre and post interviews were conducted, and classroom visits were made. A variety of activities were planned to promote discussions during the e-mail data collection process. They ranged from e-mail prompts from me, famous educational quotes (e.g. "Those who can do; those who can't teach.") to comment on, selected articles to read, and web-sites to visit. The participants did not respond to prompts to visit web-sites or articles to read; therefore, the predominant activity was responding to prompts that asked the participants to share their thoughts and experiences with the other group members on topics provided by me.

Throughout the study an ongoing analysis of the data collected was performed to determine the topics that promoted the most discussion from the group members and to help revise the initial research questions as the study progressed. As I received the e-mail messages from the participants responding to my prompts, I compared them to each other and to past e-mail messages to determine what patterns and themes were appearing. When I found a subject that stimulated more in-depth responses from the participants, I tried to explore that topic further. Additionally I tried to use the emergent themes to induce the participants to interact more with each other.

Guiding Question

The guiding question for the study was: What is the impact of e-mentoring

on early career teachers in terms of curriculum support, teaching support, emotional support, and reflective activity?

Case Study Methodology

The selection of a particular methodology in qualitative research is guided by the topic being researched, the questions being asked, and the focus desired. If the topic is a program that has clearly delineated constraints, and the focus is on "developing an in-depth analysis", Creswell recommends the case study approach (Creswell, 1998, 65). For these reasons, the case approach was used in this study. Case study methodology requires multiple data sources such as observations, interviews, and documents like surveys or e-mail messages (Glesne & Peshkin, 1992) and includes rich contextual descriptions of the participants and their contexts. The case reported here will not, however, be the individual participants, but the case of the implementation of e-mentoring strategies to support early career teachers.

The selection of participants for a case study may be done in several ways. Miles and Huberman offer sixteen different strategies for participant selection (1994). I used two of them: (1) criterion - participants all met a predetermined list of criteria and (2) snowball or chain - references were requested from others (Miles & Huberman, 1998). Validity of the case study is not affected by specifically selecting participants. As noted by Glesne and Peshkin, "the strategy

of participant selection in qualitative research rests on the multiple purposes of illuminating, interpreting, and understanding..." not on numbers and variety as quantitative research does (Glesne & Peshkin, 1992, 27).

Of special concern in qualitative research and therefore in case study methodology is the validity of the study. Stakes (1995) recommends that researchers implementing a case study approach use triangulation and member check to establish validity. He also suggests that the researcher examine his or her personal intentions in conducting the case study and directs him or her to make known his or her role and point of view to the audience.

The case I examined was the impact of e-mentoring based on the quality and nature of Internet conversations among four graduates from the same rural university and myself during the 2000 Spring Semester. The participant group included four teachers with the following demographics: two entry year teachers, two early career teachers (taught for three or fewer years), two middle school teachers, two high school teachers, two male teachers, two female teachers, two teachers who are or have participated in Oklahoma's entry year program, and two teachers who have not participated in an entry year program. See Table 1. In short, I found a varied group of participants with the common properties that all graduated from the same rural university, teach in a rural school system and had a prior relationship with me.

Population Context. The teacher-participants were selected from a pool of

Table 1
Participant Demographics

	Andrea	Betty	Bob	Tom
Male Teachers			X	X
Female Teachers	X	X		
Married Teachers	X			X
Single Teachers		X	X	
Teachers with children	X			
Reside in same town as school	X	X	X	
First Year Teachers		X		X
Second Year Teachers	X		X	
Middle School Teachers	X			X
High School Teachers	X	X	X	
Oklahoma Teachers	X		X	X
Non-Oklahoma Teachers		X		
Mathematics Teachers		X		X
Science Teachers	X		X	
Participated in Entry Year Program	X			X
Member of Professional Org. (NEA, etc.)	X		X	X

graduates from the same rural university with majors in mathematics or science education that were employed in a rural school within two hundred miles of the university. The university has an average enrollment of approximately two thousand students spread across three campuses and graduates slightly over two

hundred students per year. The student population is predominantly white. The Fact Book published by the university gives the following ethnic percentages of the student population: 88.94% White, 4.12% Black, 3.81% Native American, .57% Asian, 1.67% Hispanic, and .89% International (1999). There are slightly more female students (56%) than male students (44%). While the school is a four-year university, the majority of the students enroll in either the education program or the business program.

The education program offered at this university is accredited by the National Council for the Accreditation of Teacher Education (NCATE) and requires students to complete thirty-five hours of professional education courses, forty-two to sixty hours of courses in their major field and fifty hours of general education courses. A four-part field experience approach is used to help students interact with children and professionals in the education field. As part of their field experience requirements each student spends thirty hours assisting with an activity that is geared toward children and not in an educational setting, thirty hours observing a classroom teacher in the students' major field, and thirty hours tutoring a student in their major field. The field experience activities culminate in the student teaching practicum during the last semester of the senior year. Additionally, students majoring in education are required to complete two courses in teaching methods. One is taught by the education department and the other one is taught by the students' major department. Due to the small size of the

university, the low number of students majoring in mathematics or science education, and the unavailability of a qualified science education professor, the teaching methods classes for the mathematics department and the science department are combined.

The university is located in Oklahoma and consequently participates in the legislatively mandated Residency Teacher program. Upon completion of the degree requirements and passing of the competency tests the students are awarded a provisional license and required to participate in the Resident Teacher program. The Residency Year Committee is comprised of a university professor, a teacher from the same school and in the same field as the entry year teacher, and an administrator in the school. The committee was designed to provide the entry year teacher with a support system as she or he begins her or his educational career.

Participant Selection Criteria. Participation was solicited from past students at the university as described previously. Because their methods classes had been combined and because of the small number of graduates, both mathematics and science education graduates were invited to participate. Another criterion in presenting the invitations and selection of participants was prior relationship with the researcher. Since it was desired that a bond be formed among all the participants, it seemed logical that each participant have a previous history with the researcher so that there was an existing relationship on which to build. Selection of participants in this manner is consistent with the procedures

described by Miles and Huberman (1994) and discussed by Creswell (1998). Validity issues are addressed through avenues other than participant selection as described below.

I asked the data management secretary for the university to provide me with a list of science and mathematics education graduates for the years 1995 - 1999. These were the years I had been employed at the university, so the chances were good that I would know some of the graduates. I also wanted to find former students who were still in their first three years of teaching. There were twenty-five mathematics and science education graduates during this span of time. Since I felt it was important that I have a prior relationship with each of the members, I eliminated those students whom I did not know. This left fourteen students. I then eliminated those without current teaching positions and those with teaching positions outside the two hundred mile radius that I had established. I was left with eight possible participants. Next I consulted with the mathematics and science teacher education representative and asked him to help me select the top five candidates of the eight remaining in the pool of possible participants based on his knowledge of their teaching abilities and desire for professional growth. According to the literature three to six participants is the optimal number for small group work (Johnson & Johnson, 1994) with some researchers citing four as the best size (Burns, 1981). Therefore, I felt four or five participants would be an appropriate number for my study.

Of the five candidates the teacher education representative helped me identify, three immediately agreed to participate in the study and two declined the offer. I went back to the teacher education representative and asked him to help me identify a fourth candidate. He suggested Andrea, a person I had eliminated because I did not know her very well. The representative felt she was a good candidate because he knew her teaching abilities from his entry year observations of her, and he felt that she would likely agree to participate. She eagerly agreed to participate in the study and led me to question the necessity of having a well established prior relationship between the researcher and each participant.

Design. An initial face-to-face meeting of the four group members took place in January, 2000. I met with each participant prior to the group meeting to discuss the project, solicit commitment to participate, and gather general information. During the orientation seminar, the details of the project were discussed and the obligations of the participants were enumerated. In addition to participating in the group meeting, each participant was asked to give initial and exit interviews, to respond to a listserv, and to permit me to observe his or her classroom. After the orientation seminar the participants did not have any more face-to-face meetings with each other. The project was conducted during the Spring 2000 semester.

Three phases of data collection were planned: background, participatory, and summative. Background data were collected on each participant and his or

her school district to help establish the different contexts. I conducted an initial individual interview with each participant (See Appendix A), asked each one to complete a questionnaire (See Appendix D), and gave each one a survey to fill out at his or her leisure (See Appendix E).

The main source of data used to explore my research question came during the participatory phase of the data collection process. The participatory phase was the eighteen week period that the participants responded to e-mail prompts. All their responses to the listserv were archived. The final phase of data collection was the summative phase which consisted of a one-on-one exit interview between each participant and myself conducted at his or her school during the last two weeks of the project (See Appendix C).

Initially, the participants were asked to read and respond to the listserv at least three times a week; however, as the study progressed one response per participant per week became the standard. All responses made to the listserv were recorded and stored. The majority of the data collected were from the responses of the participants to the listserv. However, additional data were collected to address the issue of trustworthiness as described by Guba and Lincoln (1989).

Criteria of trustworthiness described by Guba and Lincoln (1989) and accommodated in this study were (1) credibility, (2) transferability, (3) dependability, and (4) confirmability. A classroom observation was made of each of the participants by me providing contextual information for a thick description

of each teacher's classroom and school environment and credibility of teacher descriptions of his or her classroom context. Classroom contexts provide a measure of transferability for readers who may explore these same approaches to mentoring early career teachers.

External auditors were used to ensure dependability. Coding validity and construct validity were both provided for. First, I established the consistency with which I had placed the data into categories. I then had a different auditor analyze the data to ensure that I was not biasing my results in my choice of data categories.

Each member of the study participated in an initial and an exit interview with me. The exit interview gave each participant the opportunity to state his or her perceptions of the project and to comment on my interpretations of the interactions that took place among the group members. Thus, through member check and peer debriefing, issues of credibility and confirmability were addressed.

Open coding techniques as described by Creswell were used to categorize the data (Creswell, 1998). The data were coded and beginning analyses made as the data became available; this continuous process of analysis allowed emergent patterns to be seen which made it possible to incorporate them into the study design. On-going analyses also allowed for the emergence of new questions to be explored and further probes to be made of the participants. Initial categories identified by the guiding questions included: requests for curriculum support, ethical concerns, knowledge of school policies, and educational philosophies.

Discussions over time along with exit interviews were used to examine professional growth and developing praxis.

I asked two colleagues of mine, one a beginning doctoral student in educational studies and the other a recent Ph.D. recipient in applied mathematics, to review the grouped data that I had assembled to confirm my coding. I identified the categories and asked them to assess the similarity of the data items in each category. A few changes were suggested during a group meeting of the three of us. They reported having some difficulty interpreting a few of the items due to a lack of context.

Additionally, I provided for inter-rater reliability by asking the chair of my department to review approximately twenty percent of my data and to establish his own categories and groupings. The data I gave to my chair were selected randomly from the participants' responses. From the complete group of responses I copied every third message. I removed the headings so that he would not know who sent the message and his interpretations could not be influenced by his personal knowledge of the participants. I used a small amount of the data that I provided to him to show him how I had performed my coding. He then coded the rest of the data without my assistance and established his own categories. Our coding techniques revealed similar categories and a match of 88% of the data grouped in each category.

At the end of the study, I provided for member check by asking each

participant to respond to an analysis of the patterns that I saw emerging from the interactions on the listserv. Discussion of their responses took place during a final interview that was conducted individually with each participant. The final interview was done with each individual privately since there were too many scheduling conflicts to have a final group interview and in order to maintain privacy.

After the study was completed and during the process of reporting the results, I calculated average values for the participants' response times and the number of lines per response. I also counted the number of responses each participant made and the number of prompts to which each participant elected not to reply. My final statistical measure was to compute the percent of responses made at a given time period. The methods of calculation follow. These descriptive statistics were used to look for patterns in response times and to offer an indication of interest for different topics.

To derive the average response time, I noted the day a prompt was made and then counted the number of days until the participants' responses arrived in my e-mail account. If the response arrived the same day the prompt was issued, I assigned a value of "0" to the response time for that message. After calculating all the response times, I added the values and divided by the total number of responses for that participant to generate the average response time. Similarly to calculate the average number of lines per response, I counted the number of lines

for each message (counting a half line or more as one line), totaled the counts and divided by the total number of responses for that participant. The percent of responses per time period was found by totaling the number of responses for each participant, tallying the number of responses per time period, and dividing the tally of each time period by the total number of responses for that participant.

The quantitative measures reinforced the themes I had discovered using qualitative methods. They provided useful insights into the qualitative aspects of Internet discourse and response patterns.

Background Data Collection

The participants selected provided autobiographic information about themselves and demographic information about the school systems in which they taught. This information was used to discern similar and dissimilar characteristics among their particular contexts. They also attended a group interview at the beginning of the study. The purpose of this initial interview was to explain the goal of the study, to delineate the specific aspects of the project, and to provide an opportunity for the participants to meet each other face-to-face and begin establishing relationships.

Participant Characteristics. The group was comprised of four members and myself. The members were mainly selected due to a prior relationship with me; other limiting criteria were teaching in a rural school system within two hundred

miles of the university, having graduated from the university with a degree in mathematics or science education, and being in their first or second year of teaching. See Table 1.

The participant with the most teaching experience of the group was Andrea. (Pseudonyms have been used to protect the privacy of the participants.) She was in her second year of teaching and had spent a year prior to that substituting and tutoring in the school system where she is now employed. Andrea is married and has one child, a two-year old daughter. Andrea is active in her school; she is the cheerleader sponsor, as well as the cross-country coach.

Andrea obtained alternative certification. She completed a four-year degree program in biology but did not participate in an education program. After graduating she decided that she wanted to teach and obtained special permission to get her certification in an alternate manner. She was required to go through an interview process, take a few prescribed education courses, and participate in an entry year program. Her student teaching experience was waved due to the substitute teaching that she had done prior to her decision to obtain certification.

Andrea was the participant I knew the least at the beginning of the study. I knew her by name only, but she was strongly recommended by the Mathematics Department Student Teaching Coordinator to participate in the program because of her strong commitment to her students and her profession.

The second participant was Bob who teaches chemistry. There are seven

other science teachers in his school though only one other chemistry teacher. Bob began his teaching career two years earlier in another state and consequently did not participate in an entry year program. His first teaching assignment was in a junior high school as a science teacher. His first year of teaching was not as successful as he had hoped and he returned to college to complete his mathematics certification at the end of the first year of teaching. He was able to complete the requirements for mathematics certification in one year and thus was beginning his second year of teaching during the third year after his graduation.

I met Bob in several mathematics courses that I taught. He is not married and has no children. During the course of the study, Bob lived with his brother in an apartment located in the town in which he taught.

Tom was the third member of the group. He and I have a unique acquaintance in that he was a student at the school where I began my teaching career and later became a student of mine at the university. I never had Tom in a regular classroom setting at the high school or university level; however, I did have an arranged class with him at the university. Additionally, I had the chance to work with Tom outside of the school setting when he was a dorm counselor for an Oklahoma Board of Regents Summer Academy that I conducted with two other colleagues. Tom exhibited an ability to interact with young people. He was able to be friendly with them while maintaining control at the same time. Tom was married a few months before he began his teaching career at a rural middle school.

He is the only participant who was adapting to married life during his first year teaching and while engaged in this study. Tom said his ultimate goal is to teach at the high school level during his initial interview; although he continued that at this time he was enjoying the pace of the middle school and the ease with which he could prepare his lessons. He said the pace gave him a lot of time at home free from school responsibilities so adjusting to married life had not been too difficult.

Tom resides in a town forty miles away from the school where he teaches. He has a 45 minute commute every morning and evening. The driving distance makes it difficult for him to attend all the extra curricular activities of the school, but he makes an effort to attend as many of them as he can.

The final member of the group was Betty. She was the member with whom I had the closest relationship at the outset of this project. She had been a work study student for the Mathematics Department. Additionally, she was a dorm counselor for an Oklahoma Regents Summer Academy that I conducted along with two of my colleagues from the mathematics department. Betty is single and has no children. Betty grew up in a small rural town and attended a very small school.

This is Betty's first year teaching. The state where she teaches does not participate in an entry year program so she does not have a designated cooperating teacher or a professor from the university coming to observe her. She does, however, take part in district organized monthly meetings with other entry year

teachers in the school district.

Betty moved the greatest distance away from her parents of all the participants in a kind of self-imposed isolation. She lives in the town in which she teaches. She calls the town a "bedroom community" since it is very close to a large metropolitan area and many of the residents work outside of the town in the large metropolitan area. Many of the residents moved to the small town so that their children would not have to attend a large urban school.

I was the facilitator of this project, and while I did not wish to influence the interaction of the group, it quickly became apparent to me that I was to play an integral part in the interactions. I include a brief biography of myself so that the reader is aware of the biases that I may have brought to the study.

I earned my Bachelor's Degree in mathematics education from the same rural university that the participants attended and had my first teaching job as a graduate teaching assistant, while working on my Master's Degree, at one of the two comprehensive universities in the state. I participated in an entry year teaching program; however, there were several years between the completion of my Bachelor's Degree and the beginning of my entry year teaching in a public high school.

My high school teaching experience was not one of the most successful or pleasurable experiences of my life. I lost my position as a high school teacher after the second year because of a reduction in force that was implemented to

incorporate teachers from an annexed school into the district where I was teaching. Luckily, a mathematics position opened up at the university where I am currently employed.

I taught for two years in a small public high school, and I strongly felt the need for a personal relationship with a mentor even though I participated in the state mandated entry year program. I felt I needed someone to guide me through my first year, other than the mentor to whom I was assigned, and I also needed a group with whom to share my experiences and who could confirm that I was not alone with the problems and frustrations that I was having. The experience left me with a desire to help other beginning teachers in a similar position through the first couple of years of teaching. E-mentoring was a way for me to reach out to recent graduates from my university and help them bridge the gap from student to teacher.

Teaching Contexts. The school system where Andrea teaches has approximately 185 students in the high school and junior high, and she has 17 students in her classes on average. Her school employs a traditional schedule with seven fifty minute class periods, one of which is designated as a planning period, and an activity period. The district has several teachers who teach at both the high school and junior high levels. The building itself is old but extremely well maintained. One unique aspect of her district is that all the buildings containing the different grade levels are located in a one city block area. Andrea is one of

two science teachers and teaches courses at both the junior high and high school levels. Andrea taught four different subjects during the time of the study: Physical Science, Life Science, Earth Science, and Biology. She also had an alternative education class. Andrea is one of the two participants who had a working computer connected to the Internet in her room for her personal use.

The teacher in the largest of the school districts of the participating group members was Bob. His school has about 1200 students though his average class size was only 15. Bob described his school, grades 9-12, as being between a small rural school and an urban school. He said they had all the benefits and problems of both types of schools. Bob notes that the actual size of the town in which he teaches is approximately 10,000 people. The school is so large because the district buses in students from the surrounding areas. While the school is significantly larger than his previous teaching assignment he notes that his class size is the same or smaller. The school district maintains a vigilant watch to insure that gangs do not infiltrate their schools.

Though he teaches in the largest school of the four participants, he has the least access to technology of all the participants in the group. He has a computer in his room -- a very old model, which he calls "an industrial size paper weight" since it does not run. None of the individual classrooms in Bob's school are wired for Internet connection. Bob used his own personal computer at home to participate in the project.

Tom teaches at a consolidated school comprised of five towns, which adds an additional dimension to that of just being in a rural school system. Since the majority of the students are bused in, there is very little time before or after school for Tom to give students extra tutoring or help them catch-up on missed assignments or tests. Tom's school has about 108 students. These students come from an area over 600 square miles. The building in which he teaches has run out of space for classrooms so they have added portable buildings to make additional classroom space. Tom's classroom is in one of these portable buildings and consequently is separated from the main school building. He shares the building with one other teacher, and though the classrooms are separate the noise from the adjoining class frequently invades his classroom. I personally experienced this when I observed his class and later when I conducted the exit interview. Tom said that it can be rather distracting at times for both him and the students.

Tom is the only mathematics teacher at his school which he cites as one source of isolation that he feels. "And you know being the only math teacher is a little bit hard sometimes, just because I don't have anybody else to ask about certain things or how to teach something or whatever." There are two other entry year teachers in his building, and he is participating in an entry year program. Besides being the only mathematics teacher, Tom is one of two males in the entire school which is another area of perceived isolation by Tom. While Tom's school has a lab of computers that are connected to the Internet, Tom does not have a

computer dedicated strictly for his use, and there are no Internet connections in his room. Tom used a computer in the school lab, as well as, a family member's computer to participate in the project.

Betty is one of three mathematics teachers in her school. Her school, which serves the ninth through twelfth grades, has approximately 300 students. She has an average of 16 students in each of her classes. One of the other mathematics teachers is also an entry year teacher, and the remaining mathematics teacher has been at this particular school for three years. She says that the administration likes the youthfulness of the mathematics department because "you're all still young enough that you are bringing new ideas in and can relate to the students well . . . " Betty's school building is the newest among the buildings of the other participants. She, like Andrea, has a computer in her classroom that is connected to the Internet and was provided by her school system for her use. See Table 2 for a summary of the participants' schools demographics.

My teaching position was one of two and a half mathematics positions at a high school of about 250 students. My average class size was around 20 students; I had four preparations and taught six fifty minute classes per day with the seventh fifty minute class period being reserved for my planning period. I did not have any access to a computer during my first year of teaching at the public high school. A computer lab was installed in my second year of teaching but no Internet access was possible.

Table 2
Participants' School Demographics

	Andrea	Betty	Bob	Tom
District Population	2081	2526	17717	2967
Size of School	185	296	1200	108
Average Number of Students per Class	17	16	15	16
Ethnicity of School				
Caucasian	82%	100%	78%	94%
Black	0%	0%	12%	1%
Asian	1%	0%	0%	1%
Hispanic	17%	0%	3%	1%
Native American	1%	0%	6%	4%
Number of Beginning Teachers in Building	1	3	1 in subject	2
Number of Other Teachers in the Same Subject Area	1	2	1	0

Group Dynamics. Although the participants all graduated from the same university within a three year period they only knew each other according to their respective science or mathematics majors with the exception of Bob and Tom. See Figure 1. Bob and Andrea knew each other from classes they took together, in particular a mathematics/science teaching methods course. Bob and Tom grew up in the same town and attended the same high school; however, Bob is older than Tom so they were not in the same grade and considered themselves to be acquaintances only. Tom and Betty probably knew each other the best among the group of participants. They had taken several classes together and also had shared

dorm counselor responsibilities for an Oklahoma Regents Summer Academy conducted by two of my colleagues and me during the summer of 1999. The lack of cohesiveness of the group was an obstacle that was difficult to overcome during the span of the project. There seemed to be an air of politeness and an unwillingness by each of the members to confront the others. Additionally, all the members were from the same geographical region and held beliefs that were essentially the same on most topics. (Discussed in Chapter 4).

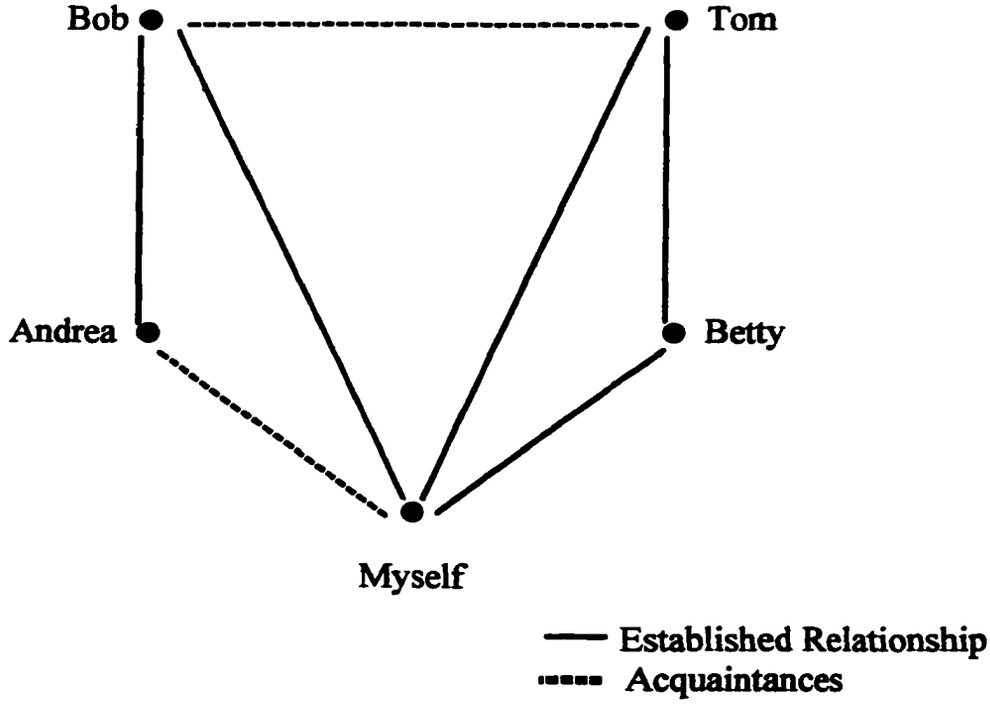

Figure 1
Relationships of Group Members Prior to Participation in Study

Group Meeting. Before the study began, I invited all four participants to come to the university for a face-to-face meeting. I chose the university as a meeting place since it was about mid-way between the four different towns of the participants' residences and could provide a familiar setting to all of the participants. The purpose of this initial interview was to explain the goals of the study, to delineate the specific aspects of the project, and to provide an opportunity for the participants to begin establishing relationships. Both female participants noted that this face-to-face meeting was necessary for them to bond with the other group members. (Discussed in Chapter 5.)

I began the group interview by having each person introduce him or herself and tell basic information like place of residence, marital status, grade level taught, subject taught, number of years taught. Next, I went over the design of the project and offered a sample prompt. I had the participants respond to the following quote: "Students don't fail; teachers fail." We went around the table and each person had an opportunity to state his or her opinion then a general discussion began. At the conclusion of the discussion, I told the members that I hoped the same types of interaction would occur on-line during the study. I concluded the interview by confirming each members e-mail address and collecting release forms, demographic questionnaires, and beliefs surveys. After the initial meeting, the five of us went to lunch at a local restaurant. The purpose of the lunch was to provide an informal environment for them to further the

relationship building begun earlier that morning. See Appendix B for a complete list of activities.

Participatory Data Collection

In an effort to provide multiple perspectives and initiate discussion, I planned several different types of activities, such as readings and criticisms of web-sites, that could be accomplished primarily on-line. However, the participants were unable or unwilling to partake in these activities. The primary activity of reading and responding to e-mail prompts and responses, therefore, became the sole activity.

The design of my study called for me to lead the participants into various areas of discussion such as violence in schools, block scheduling, and equality of science and mathematics education. I hoped that the discussions would naturally lead to the participants questioning each other's ideas and submitting their own topics of interest. Once this happened I planned to lurk in the background and interact only when it became necessary to help them refocus their discussions or when a challenge was needed to stimulate reflective activity.

Additional resources that I planned to use included asking the participants to write personal reflections, to read and critique on-line articles, and to visit various web-sites. Two examples of personal reflections that I asked the participants to do were to write letters to the current student teachers sharing their

experiences and the information that they wished someone had told them and to define what the ideas of learning and teaching meant to them and then to use those ideas to develop their own philosophy of teaching. See Appendix F for a list of all prompts.

An example of one type of on-line activity I asked the participants to do was to use a web-site suggested by Tom to find an article on charter schools. I asked them to read and comment on the article. I selected charter schools as the topic because Bob had previously raised the subject and I was trying to create more interaction among the participants relating to their responses. (Bob was the only participant to submit outside articles and news stories to the group. On several occasions he offered controversial educational topics to the group for discussion.) I also suggested a few web-sites for the group members to visit and solicited their comments about them. In an effort to get them more involved in the direction the project was taking, I encouraged them to provide their own favorite web-sites for the group's consideration. However, the additional topics that I provided and requests that I made from the participants went unanswered.

During the participatory data collection phase of the study, I offered weekly questions, or prompts, via e-mail to which the participants responded. In total, there were eighteen weeks of data collection with twenty-seven separate prompts provided by me. See Appendix F. While the intent was to slowly separate myself from the group and provide and facilitate a forum for their discussions so they

could begin to mentor each other, we never moved beyond my need to provide weekly prompts. My role in the group, therefore, became a key component of analysis (discussed in Chapter 4) with implications for developing mentoring relationships (discussed in Chapter 5).

The prompts were of three basic types: (1) a statement or question from me directed to the group, (2) a statement or question from me directed to the group encouraging further exploration of a topic from one of the participant's responses, and (3) a directive from me for the group members to submit a topic to the group and respond to each of the other group members topics. See Table 3.

Summative Data Collection

During the last two weeks of the project, I once again visited each of the participants in his or her school. This visit would be our final meeting, and the final activity in which the participants would take part. I scheduled the exit interview with each participant individually at his or her convenience. The interviews lasted from thirty minutes to an hour. I asked each participant to relate his or her perception of the study, to comment on my interpretations of the group interactions, and to offer suggestions to improve the e-mentoring concept. See Appendix C for a complete list of questions. The summative phase of the data collection was designed to provide closure for the participants and ensure dependability and confirmability of the study.

Table 3
Examples of Prompt Types

Type 1 Direct Statement	I have been reviewing some of my notes and I came across something peculiar. At the beginning of each interview I asked each of you to define "mentor," all of you gave similar definitions. Something to the effect of "a mentor is someone who provides you with support and ideas, offers suggestions on how to deal with particular situations, and listens when you have a bad day." None of you said anything about sharing success with a mentor, nor did you suggest that the mentor might get something out of the relationship. What do you think about that?
Type 2 Prompt for Further Exploration	Did you notice that the science teachers Andrea and Bob didn't see a distinction between scientists and science teachers, but the math teachers Betty and Tom did. I must confess that I also distinguish between a mathematician -- somebody who researches math and a math teacher -- somebody who teaches math. I don't think one is more important than the other; there is just a different twist on what they do. I think of myself as a math teacher not a mathematician. In the world of academia, there is a sharp distinction between mathematicians and mathematics educators with mathematicians tending to look down their noses at math teachers. I get the feeling that the sentiment is the same in any hard science. It kind of goes back to the quote "those who can do; those who can't teach." Did you get this kind of feeling from any of your professors at *the university* (changed to protect privacy of participants)? Why do you think there was a division (between math teachers and science teachers) and the responses to the previous questions?
Type 3 Directive to Share with Group and Respond to Other Members	I have another two-part discussion for you all this week. (1) First share with the group some problem that you have had with a class, a parent, another teacher, etc. It could be something you have already resolved, or something that you are still trying to figure out. (2) After reading each member's contribution, share with the group how you would handle the problem mentioned or how you have dealt with a similar problem. Remember that EVERY teacher has had problems sometime during their teaching career.

Summary

This chapter has discussed the design of the project and introduced the participants. The goal of the project was to provide support for beginning teachers in rural schools by using the Internet to do e-mentoring. It was hoped that this would help eliminate the feelings of isolation felt by many beginning teachers in rural areas. The use of the Internet allowed previously acquainted students to maintain their relationships even though they were hundreds of miles apart. The use of previously acquainted students from the same university allowed them to continue building their connections and removed the need to spend time getting to know each other. Instead, they were able to begin discussing and sharing problems encountered in their school settings.

The design called for a small group of participants to join me in on-line discussions of their day-to-day experiences. Initial interviews and exit interviews were conducted privately between each group member and myself. The initial interviews provided background data while the exit interviews offered the participants the opportunity to tell their impressions of the study and to comment on my interpretations of the groups interactions. The participants were also asked to complete demographic questionnaires and a beliefs survey to provide me with a context to work from. Other data collected were classroom observations made by me.

The four participants, Andrea, Bob, Tom, and Betty, were graduates of the

same university with majors in mathematics education, science education or both. They had some previous knowledge of each other though the depth of knowledge depended on the different pairs. For example, Tom and Betty were both part of a summer academy conducted at the university, and Andrea and Bob attended some classes together. While the participants had some similarities, there were also many differences between them. Some were married; others were not. Some taught high school, some junior high, some both. Some taught in Oklahoma; some did not. Some participated in an entry year program; others did not. Altogether there were many differences between the participants but there was also enough common among them to permit a sense of comradery.

The project went in a different direction than I had anticipated. The participants responded best to prompts which came directly from me. They did not challenge each others' comments nor did they submit topics for the group to discuss unless I specifically requested it. The analysis in Chapter 4 will explore these developments and the implications of these occurrences will be discussed in Chapter 5.

CHAPTER FOUR

ANALYSIS

E-mentoring was designed to help early career teachers make the transition from student to teacher, particularly those in a rural setting. By using on-line mentoring with a group of former classmates and acquaintances the need to establish initial bonds was eliminated and it was hoped that the group would be able to enter more quickly into the process of providing support and teaching suggestions to each other. The group was composed of four mathematics and science education graduates from the same university and myself, a mathematics professor, at that same university. The group met once in person, and each member met with me individually for an initial and an exit interview and again during a classroom observation made by me. The rest of the contact with the other group members was via e-mail.

The framework for this project was provided by the research question: What is the impact of e-mentoring on early career teachers in terms of curriculum support, teaching support, emotional support, and reflective activity? The original plan was for me to initiate the first few e-mail discussions and then for the group members to submit ideas, concerns, or questions to each other as needed. The envisioned interaction between group members did not materialize.

Consequently, the orientation of the project was changed, and I continued to send prompts to the group members throughout the study. The data collected were weekly e-mail responses, initial and exit interviews, a group interview, classroom observations, and a beliefs survey. The various data types allowed for triangulation. The data was continuously analyzed throughout the study. This allowed me to discern subjects and topics of higher interest to the participants which were then used to promote more in depth deliberations among the group members.

Evolving Design

The study took place during the 2000 spring semester, lasting eighteen weeks in duration. There were twenty-seven e-mail prompts sent from me to the participants that served as the primary data solicitations. During the eighteen week period, three types of prompts were used. Four themes emerged from the data. The prompt themes are discussed below. The following section discusses the development of my role as facilitator and researcher as it relates to the unexpected results that all prompts were researcher directed.

Prompt Themes. Four primary themes were addressed by the participants in the prompts. See Table 4. One of these themes was classroom issues such as motivation, standardized testing, and special needs students in the classroom. Another subject was school policies and structures. We discussed the chain of

command in each of the different schools to which the participants belonged, block scheduling, and charter schools. The area that prompted the longest responses from each of the participants was ethical concerns. Drug testing, teachers' rights, and the restrictions placed on pregnant teens were some of the points that were raised. The last area, educational philosophies, was artificially generated by me when I sent prompts asking the participants to define learning and teaching and finally to state their own philosophy of education.

Table 4
Examples of Prompt Themes

Classroom Issues	It seems that most of you have trouble motivating your students at one time or another. Share some of the things you have done in the past to get your students involved in the learning process.
School Policies	The article Bob mailed said the parents were going back to the next school board meeting to see what punishment the teacher was going to get. Who's in charge of disciplining teachers in your district the principal or the school board?
Ethical Concerns	You all seem to agree that drug testing the students is ok. What about drug testing for the teachers? On a similar note, when I was in high school if a girl was pregnant she was not allowed to participate in ANY extracurricular activities -- sports, cheerleading, music programs, club officers, etc. What do you think about that? Does your school have a similar policy? If so are we trying to protect the health of the girl and her unborn baby or are we trying to dictate moral standards?
Educational Philosophies	Now that you have defined what it means to learn, the next logical question is what does it mean to teach?

Evolving roles. In my original design of the project, I hoped to take a very small part in the interactions of the group members. I planned to facilitate the acquaintance period of the group and then slowly remove myself from their discussions to provide them with an opportunity to begin peer mentoring. I scheduled a face-to-face group meeting to promote rapport among the participants and encouraged each one to share information about himself or herself and his or her particular teaching situation. I invited all of them to share some of their experiences at the university. I tried to help them forge a bond in the hopes that a community would form as the project progressed and that conversations via the Internet would occur naturally as a means of mutual support and sharing.

On the Monday following the group meeting, I e-mailed each of the participants the following prompt designed to encourage reflectivity and group discussion of a fairly generic topic. (See Appendix F for a complete list of my prompts.):

> During one of my interviews for a high school teaching position, the interviewer asked me how I defended the education profession when someone said "Those who can do; those who can't teach." I replied that I ignored such comments figuring if the person was ignorant enough to say such a thing then s/he didn't know what s/he was talking about. I didn't get the position so I am guessing the interviewer was looking for a different response.
>
> Has anyone ever said the rather famous quote to you? What was your response to that person, or what would you have said to the interviewer?

My goal was to provide them with a topic that was sufficiently controversial to

provoke responses and yet was general enough so that none of the participants would feel threatened because I wanted them to reveal personal information. The responses I received were quite similar and nonconfrontational.

For example, Betty responded

> Betty - I have heard this quote in education classes and also in my exit interview. I responded that I do not agree with the quote. What it implies is that people who choose teaching as a profession can do nothing else. If they could they would be out in the workforce doing something. I believe that it takes someone very special to be a teacher. They not only have to deal with teaching their subject matter, which they must know a lot about, they have to deal with many other things that people in the "workforce" don't have to deal with such as parents, students who are not motivated, "problems" that students have and anything else that arises. I do not think that just anyone can teach because they have to be "involved" to be successful. Not everyone wants to do that. We also have the job of preparing these students to go out and become productive citizens so they can contribute to society. I have decided to teach because I can and I choose to, not because I can't do anything else. (9:22am, 1/24/00)

Later that afternoon, Bob sent the following reply

> Bob - I have heard this quote many times during job interviews. I always respond that if those who teach can not do whatever they are teaching then the world is in trouble. I say this because somebody has to teach others how to do something in the first place. Without a teacher nothing is learned. It also takes a special person to want to take on the challenge of educating today's students and not everybody wants to or has the ability to do so. (5:43pm, 1/24/00)

Ironically, they both began their responses with the same five words and then continued to express similar ideas. Both noted that teachers were the ones that educated the work-force, that teaching requires the ability to cope with a variety of

problems, and that it takes a very special person to be a teacher.

In general, the participants were slow to respond to my e-mail prompts; each seemed reluctant to be the first person to share an idea. They also mainly responded to me directly. They did not question each other's comments or challenge the other members' ideas. I next tried to model a way they might consider using the web discussions to support their own teaching. I offered a prompt designed to encourage sharing of their own particular situations by asking them to respond to a situation I was facing in the classroom. I sent each of them a message describing my frustrations with a particular class that I was teaching at the time and two students that were especially troubling me.

> I have just given my college algebra classes their first exam and now have some very unhappy students. Two in particular.
>
> Case 1: A nontraditional psych major who has attempted the class two previous times. This student is quite irate that all majors are required to take college algebra. S/he feels that algebra will not be used in his/her life and does not see the need for the requirement. Student has missed three class periods in a TTh course. Assume the person is never going to use algebra ever again, is it legitimate to require a college grad to demonstrate competence in college algebra (the level of the course is not much higher than algebra 2 in high school). Do you think that college algebra is so difficult that student's who can make A's and B's in other courses can't even pass it. (I think the same questions should be asked of a freshman level science course like physical science.)
>
> Case 2: This is a traditional student, in major unknown, who finished only 15 questions of a 20 question test. Became quite upset when I wouldn't allow extra time to finish the exam. My reasoning was that I couldn't allow extra time to all the students (since some may have a class immediately following my class) so I shouldn't allow extra time for all the classes. The majority of the students

> have finished by the end of the hour. Am I being unreasonable to think that a student with no known disability should be able to complete 20 questions that came straight from the previous homework assignments?
>
> I have really been troubled by my 2 students and would appreciate any thoughts that you have. Incidentally, if you have any problems that you are struggling with feel free to let the group know. Someone probably has a perspective that you haven't had yet. . .

While the participants were very supportive of me and my situation and they all sent suggestions of what to do with my students, the e-mail did not have the desired effect in that the participants did not take my invitation to discuss similar issues with the group. They continued to mainly respond to me and my prompts.

My next effort to get the members more involved was to be more deliberate in asking for specific responses to each other.

> I thought we would try something different this week. I'll send a message to Andrea and have her send just her response to Bob who will send just his response to Tom. Tom will send just his response to Betty and Betty will send her response back to me.
>
> I thought this would offer a change of pace and let you respond more to each others thoughts.
>
> I think we can get 2 chains going. The one described above and one going the opposite way, i.e. Betty to Tom to Bob to Andrea.
>
> I'd appreciate it if you would carbon copy me as you e-mail to each other.

I suggested we use two chains because I knew how slow some of the participants were in responding to the prompts, and I thought the participants at the end of the chain would wait all week before any messages got to them if we did not have two

chains going in opposite directions.

The responses still appeared as if they were addressed directly to me. I suggested the topic of school violence to Betty for use in the second chain which began with her. She began the chain with the following message.

> Betty - I feel safe in my school. I may have blinders on, but I feel that for the most part, the students here are good. I know that the school has zero tolerance for weapons of any kind. We have also developed a crisis procedure manual so we are all informed of what to do in case of an emergency of any kind. I believe that all schools have to be concerned with the availability of weapons, but in . . . [named town], we do not need metal detectors or armed guards at the door. This is still a pretty laid back community. (8:03am, 3/2/00)

Her response simply answered the question, "How safe do you feel in your classroom?" posed by me. She did not ask the other group members to comment on anything in particular, respond to a question or criticize her thoughts. Her prompt did not appear to be designed to promote discourse.

At this point, I decided to concentrate on helping each of the participants develop his or her own reflective activity and to examine the results more on the basis of what benefits each individual received from the project and less on the bonds that the group established. The end result is that I played a major role in the project. I provided the majority of the prompts to the listserv, and I was the main person to probe the other group members' comments.

Results

One factor that influenced the participants' interactions was the homogeneity of the group. They shared similar beliefs on most topics discussed. Therefore they spent little time challenging each others' comments. As Bob related to me in his exit interview:

> Bob: I never really saw anything that really wanted me to question or antagonize them too much. It was basically . . . stuff that they weren't really screwin up on or stuff that sounded good to me. (Exit Interview, 5/16/00)

This response suggested that the similarity of backgrounds may have limited discussion because of lack of variance in expectations and perspectives.

In her exit interview Betty said:

> Betty: ...And then the others that was their opinion and I just don't...I feel like I'm entitled to mine and they're entitled to theirs and I'm not gonna really question how or what they think. (Exit Interview, 5/11/00)

Here, the homogeneity of the group not only perhaps limited the potential for differences in perspectives being expressed but also created a demeanor of politeness. There was an overt attempt by the participants to maintain a polite discourse, as evidenced by Betty's response. The similarities of the participants' beliefs were indicated by their close scores (See Table 5.) on the different parts of the Teacher Belief and Attitude Survey in Mathematics (T-BASM) (reproduced in Appendix E) (Fleener & Nicholas, 1994), further suggesting similarities among participants may have stifled rather than encouraged discussion.

Table 5
Participants' T-BASM Scores

	Traditional	Constructivist
Andrea	85	78
Betty	79	74
Bob	71	83
Tom	81	75

T-BASM. After the conclusion of the initial interview, I left each participant a copy of the T-BASM and asked him or her to return the completed survey to me when we met for the group interview. The T-BASM was constructed by Fleener and Nicholas to help them study the change in beliefs of preservice teachers after taking a mathematics methods course. The forty-eight-statement survey is comprised of three subscales: (1) mathematics learning, (2) mathematics teaching, and (3) classroom control. Twenty-four of the statements were designed to reflect a traditionalist view with the other twenty-four statements reflecting a social constructivist view. The participant is asked to rate the statement with numbers from one to five corresponding to the options strongly disagree, disagree, neutral, agree, and strongly agree. Two scores are generated from the survey: one measuring traditionalist views; the other measuring constructivist views. The possible range for both scores is from 24 to 120. The lower the score the less likely the person is to have that tendency (Fleener &

Nicholas, 1994).

The results of the T-BASM indicate that the participants shared similar views on the constructivist and traditionalist statements. Scores between 60 and 84 on any single scale indicate a "middle-of-the-road" response. It was evident that all participants were neither strongly traditional nor strongly constructivist and that all were pretty uniform in their responses. The homogeneity of the group proved to be an interesting aspect of the project. The types of interactions that I had anticipated developing never materialized while other aspects arose that I had not anticipated.

Other Measures. Following are some general tallies of the lengths of the responses, time to respond, number of overall responses, and number of prompts to which participants did not respond. See Table 6. These values are given only to help establish the general tenor of the interactions made. Generalizations should not be drawn from the data. These measures were intended to provide a glimpse of response patterns that could be further explored more qualitatively.

These data help illustrate that Bob was frequently the first participant to respond to prompts and Betty was usually the last. The data does not show, however, the two times when it took Tom almost a week to respond to different prompts. His short response times on other occasions kept his average response time low. The data shows that Andrea tended to have the longest responses followed by Betty, Bob and Tom. While the female participants tended to write

the longest responses; the data shows that the male participants responded to the most prompts. Again, these data were given only to help establish the general pattern of the responses of the participants.

Table 6
General Data

	Andrea	Bob	Tom	Betty
Average Response Time (in days)	2	1	1	3
Average Number of Lines per Response	12	7	6	9
Number of Prompts Responded to	34	36	36	32
Number of Prompts Not Responded to	3	1	1	5

Interaction of Participants. The three types of prompts used in this study are described in Chapter 3. They are (1) a statement or question from me directed to the group, (2) a statement or question from me directed to the group encouraging further exploration of a topic from one of the participant's responses, and (3) a directive from me for the group members to submit a topic to the group and respond to each of the other group members' topics.

The majority of the prompts were of the first type. I sent a statement or

question to the group, and each of the members sent a reply to me rather than to the group as a whole. An example of one such prompt-response grouping follows.

Prompt 2/7/00 "Something to Think About"

I distributed your letters to the student teachers last Thursday. Today is their first day in the classroom. I will forward your letters so you can see what everyone else wrote.

I have been reviewing some of my notes and I came across something peculiar. At the beginning of each interview I asked each of you to define "mentor," all of you gave similar definitions. Something to the effect of "A mentor is someone who provides you with support and ideas, offers suggestions on how to deal with particular situations and listens when you have a bad day."

None of you said anything about sharing successes with a mentor, nor did you suggest that the mentor might get something out of the relationship. What do you think about that?

Bob - I think the mentor does receive benefits from the relationship. They see the rewards of their help in the comments of how well an idea or suggestion works. They also get to prevent mistakes that they had to learn the hard way which I would think would be a plus. (5:56pm, 2/7/00)

Andrea - I have not really thought about it but I think I would share my successes with my mentor, particularly if he/she had offered advice to me on how to reach that success. I also feel that they would benefit from the relationship simply by feeling the self worth of helping somebody else. (10:29pm, 2/8/00)

Betty - I believe that our "mentors" do get something out of the relationship as much as we do. They gain a friendship with us and they also have someone to share their ideas and their bad days with also. I think that they also could benefit from some of our fresh ideas that we have. (7:37am, 2/9/00)

Tom - I think that is a good point. I usually don't think about those things when I think of a mentor. I do usually share successes

with my mentor teacher and hopefully he does get something from our relationship as well. (1:54pm, 2/9/00)

Figure 2 illustrates the interaction pictorially. Note how each of the participants states his or her opinion on only the idea of sharing success with a mentor. None of them commented on or criticized any of the other participants' responses, and none of them considered the "why" of the prompt. They did not reflect on what exists in their concept of mentor that causes them to see the relationship as one of the mentor giving and them taking.

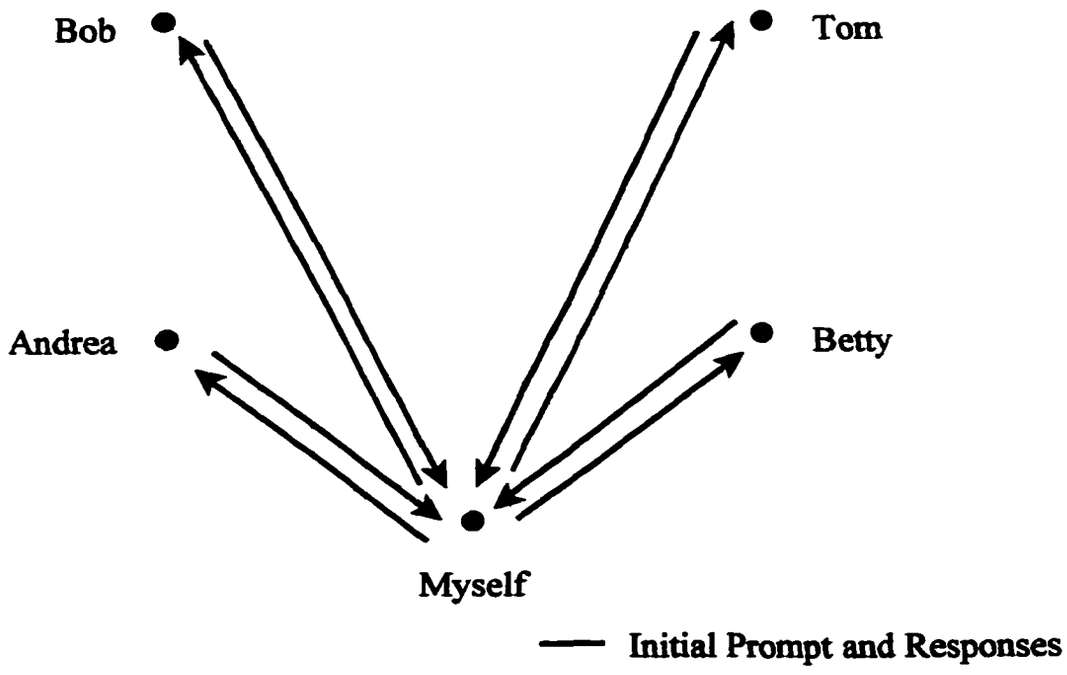

Figure 2
Interaction of Participants to Direct Statement from Me

When questioned during the exit interview why he mainly tended to

respond to me Tom said:

> Tom: Well probably just cause of the way it came out. You know it came out like you were asking me a question and I was responding to you. (Exit Interview, 5/17/00)

Bob responded, when asked the same question:

> Bob: But most of the time it was just . . . probably because we know you better or I know you better than I know the rest of the group and it was more of a personal deal there. (Exit Interview, 5/16/00)

In an effort to promote more discussion of the same topic, I tried asking the participants a follow-up question based on one or several of their responses to my initial prompt. The typical interaction that happened when I employed this strategy is illustrated in Figure 3 which diagrams the discussion the group had about the distinction between mathematician/mathematics teacher and scientist/science teacher. Both science teachers replied that they considered themselves scientists while the mathematics teachers said they saw themselves as teachers, not mathematicians. In a follow-up prompt to the group, I pointed out the division by subject area in their responses and asked them to explain what they thought caused the partitioning to happen as it did. The participants' initial responses were all directed to me as were their secondary responses to my follow-up question.

The responses of all the participants to the various prompts tended to be direct statements to me; they did not pose questions or make comments on the others' responses. The only exception to the participants' statement responses

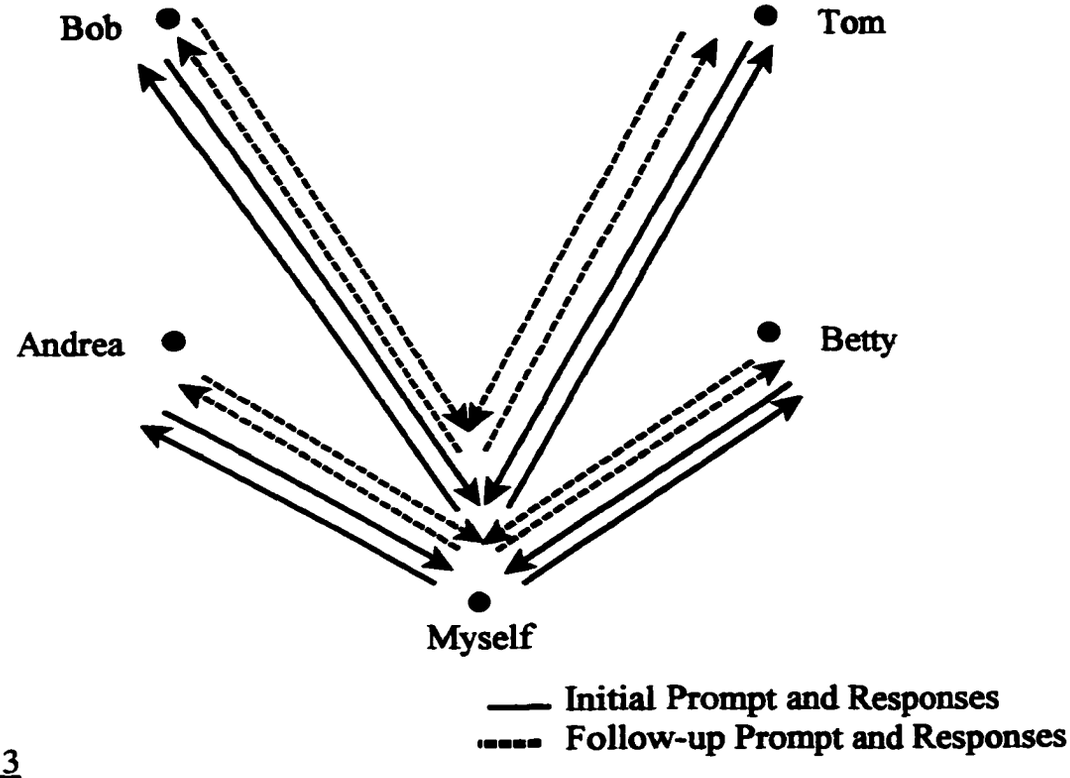

Figure 3
Interaction of Participants to Direct Statement and Follow-up Question

was when I specifically asked them to respond to each others' comments. Occasionally, one of the participants would ask a question as his or her response. The majority of the responses to other participants' ideas, however, were of the form of agreeing with the statement or complimenting the author of the statement. Responding to the group about a problem Tom shared, Bob wrote "The way Tom settled his problem was pretty good..." (6:27am, 3/24/00).

Another effort on my part to get the group to interact more with each other was to propose a round robin response system. I chose one participant to start the chain and provided a direction for the chain. I offered the starting participant a subject for discussion, but told her she was more than welcome to choose one of her own. I offered a topic because I did not want the participant starting the chain

to feel pressured to develop her own topic even though I hoped she would elect to use her own idea. She did not; she submitted my topic of collaboration for the round robin discussion. The interactions are pictured in Figure 4.

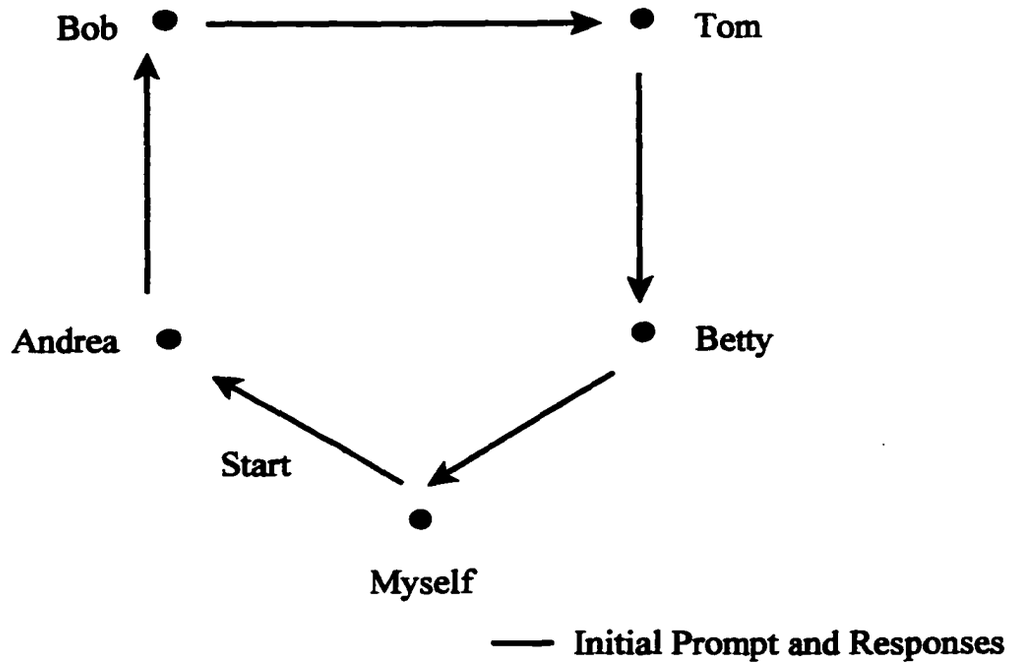

Figure 4
Interaction of Participants during "Round Robin" Activity

We completed two separate chains in this fashion. The written responses from one are below.

> Prompt 2/28/00 "Collaboration"
>
> Do you have any ideas on how math and science teachers can collaborate? Have you ever participated in such a project? Do you think there is a need for such collaboration? Would it be possible given the time restrictions both during the day and during the

semester?

Send only your response on. If you have a different idea or topic that you would like to address, please feel free to do so. The above is only a suggestion to get you started in case you draw a blank as to where to begin.

You might want to include the direction the e-mail is going so the two chains don't get confused.

Andrea - The topic was whether or not I thought math and science could be collaborated in any given situation. I think that you could definitely collaborate some areas of science with math. I know I always have to "review" myself at the beginning of the year when we work with significant digits and the metric system. I also use a lot of math in my physical science classes to explain force, density, etc. I have never participated in a project where these two areas were collaborated although I do think it could be a change for the students and possibly bring in a little more interest into both areas. I know that during a given day, it would be near impossible to work them in together. I would have to get with one of the math teachers and he/she would have to teach what was needed during her time with those students and vice versa. (8:33pm, 2/29/00)

Bob - The topic is whether science and math could be collaborated in any way. My response is of course because I do it everyday in chemistry. Chemistry as well as physics is the collaboration of math and science. Without one the other makes no sense. (4:10pm, 3/1/00)

Tom - I absolutely think that math and science go together. Personally, I don't use a lot of science in the classroom but I know that our science teacher does include math. (3:13pm, 3/3/00)

Betty - I agree with Tom. Science and math do go hand in hand. I give examples of where math is used in science, but I know that science classes use more math in their applications. (12:40pm, 3/7/00)

The responses were still a statement of the participants' ideas on the topic. No challenges or questions were raised. In fact the round robin method had a drawback, the responses took so long to make it to the end participant that in one of the chains the end participant failed to respond. The end participant in the second chain (the one illustrated above) noted in a response prior to the one above "By the way, this is the first response I have sent..." (Betty, 8:03am, 3/2/00) seeming to ask "Have I been left out?" The length of time it took for the responses to get back to me prompted me to begin a new discussion before I had received all the responses to the round robin chain.

The final strategy I employed was what I called two-part activities. First I asked the participants each to submit a topic to the group for discussion. Second, I asked the group members to comment on each of the other participants' topics. When asked during the exit interview what they felt was the best interaction they had with the group, two of the participants cited two-part activities. In particular they both referred to the interaction between Bob and Tom that occurred during a discussion about student motivation.

Prompt 3/24/00 "Re: Problems"

> Bob - Here is my problem. I have a very bright student who is not making the grade he should because he does not care and he will not turn in homework. I have talked to his mom and she knew of the problem and has tried many different things to try to help and persuade him to care and try harder. I have gotten to the point where I think I have done all I can and I am now concentrating my efforts on the other kids that I think I can "save". Any ideas? (6:47am, 3/24/00)

Tom - That is a very tough situation. I have some students that are very similar to your case. My principal always says, 'You can lead a horse to water...'. I, personally, try to talk with them about other things and just get them to open up to me. Hopefully, by letting them know I care it will help them. (11:22am, 3/24/00)

Bob - I have tried to talk to the student about other things and that did not work - is there a time you think - screw it - and find some other things to devote your time to? (4:09pm, 3/24/00)

Andrea - This is a tough one. I think that you are showing him you care by the amount of attention and effort you are putting out to him. And getting his mom involved is important, too. It seems like you have covered all areas...I had a student like that...she is one of my physical science students. She made a B first semester and 3rd 9 weeks...she finished with a 25%. This last nine weeks, they put her in a study hall in the afternoon where she finishes work she didn't get done that day because if it gets taken home it is not coming back. (2:53pm, 3/26/00)

Tom - Bob, there are times I do think that. Hopefully, I don't think that way everyday about a student but there are a lot of times I do. There are a lot of days I will almost give up on getting them to do the work if they will just be quiet and not bother others. Other days I still try to get them going. (2:33pm, 3/27/00)

Betty did not respond to this prompt. The time period corresponded to her spring break.

This particular prompt-response grouping is significant in two ways. First it is the only interaction where a participant responded twice to another participant. See Figure 5. Second, this grouping contains the only response where one participant specifically addresses a prompt to any one. The interaction between Bob and Tom exhibits more depth of thought than any of their previous

responses. They went beyond a simple statement of their opinions about a topic and responded to the feelings behind the topic of how to motivate a student.

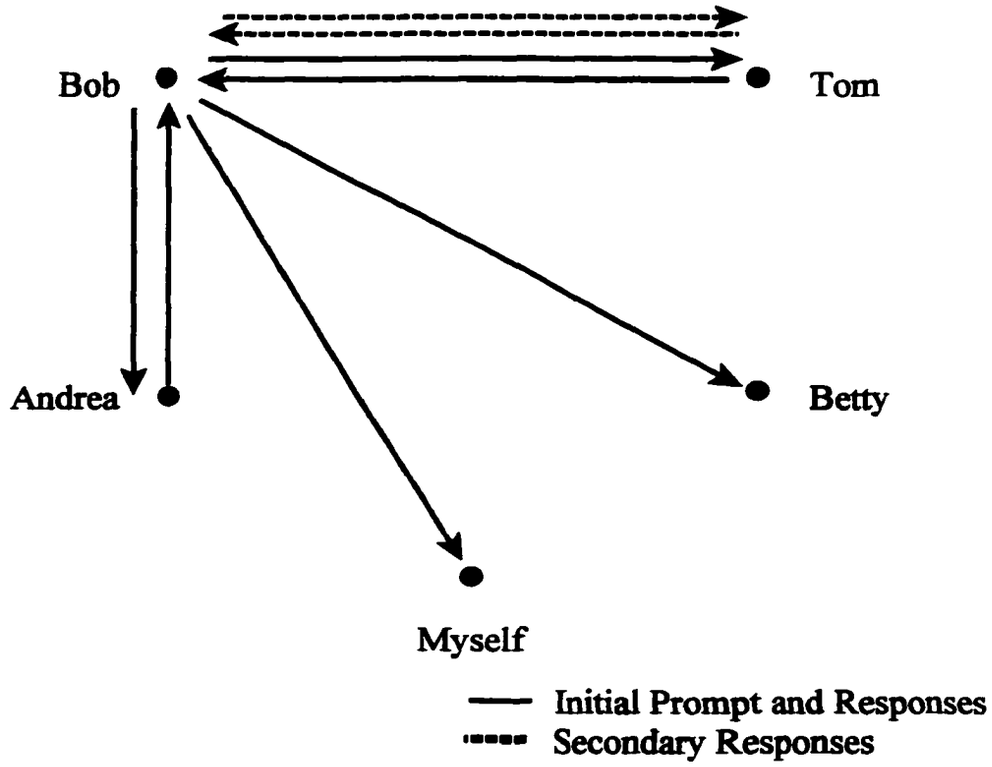

Figure 5
Interaction of Participants to Directive to Share Problem with Each Other

I was able to achieve the most interaction from the participants when I combined a follow-up question to a two-part activity. In response to my directive to provide a topic for group discussion, Betty described her frustrations about administering standardized tests and asked the others how valid a measuring tool they felt the tests were. I responded and asked how the tests Betty was

administering compared to the competency tests they were required to take to qualify for teaching certification. Figure 6 illustrates the interactions that took place. The participants' responses were statements of their thoughts on the suggested topic as were their responses to my follow-up question. Once I entered the discussion and asked a question, all their responses became directed to me.

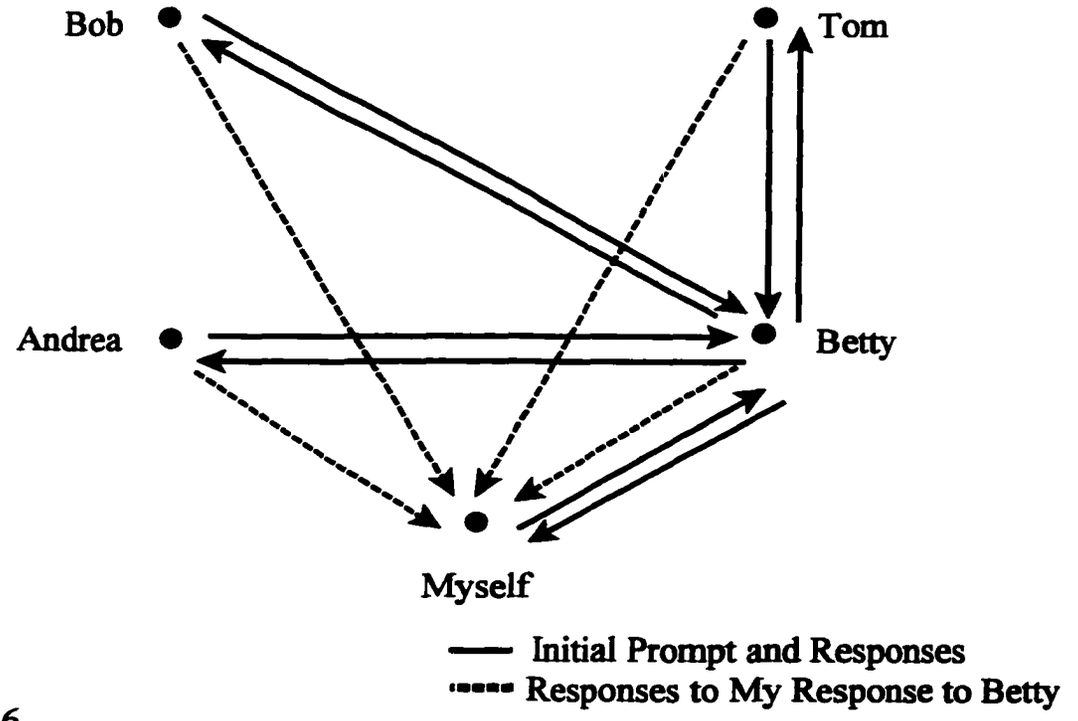

Figure 6

Interaction of Participants to Directive to Provide Topic for Group Discussion with Follow-up Question

Impact of E-mentoring

Following is a discussion of what the results of this project signify with regards to the research question: What is the impact of e-mentoring on early career teachers in terms of curriculum support, teaching support, emotional support and reflective activity? All the participants reported that they enjoyed being a part of the project and felt they received benefits from their involvement in the project. The main benefit reported was realizing that others were in the same situation as them. When asked what she gained from this experience, Andrea said "I guess the main thing is just knowing that the feelings that I share or concerns about students, other people have them too" (Exit Interview, 5/15/00). Betty replied "Yes. It made you feel not so isolated" (Exit Interview, 5/11/00) when asked if it was helpful to have other people share that they were going through the same type of problems. Showing their enthusiasm for the program, all the group members said yes when asked if they would participate again.

One of the major drawbacks of the project was the reliance of the participants on the mentor to stimulate discussion. They were all willing to share their thoughts and ideas with each other, but none of them was willing to accept the responsibility of providing topics for discussion. Each participants' unwillingness may have resulted from a lack of confidence in his or her ability to construct a discussion topic, a fear of exposing himself or herself to the group, a shortage of time, or a combination of these and other concerns. The result, none-

the-less, is that the mentor of a project like the one described here needs to be dedicated to the effort of inspiring the participants to challenge their personal beliefs. A more specific account of the impact, including both the benefits and drawbacks, of e-mentoring follows.

Communication Obstacles on the Internet. One of the obstacles encountered by this project was the technology being used. At one point during the study, I had the participants e-mailing each other. Andrea, however, was not able to connect with Bob. She e-mailed me to confirm his address, and when the message did not go through the second time, she sent me the message so I could forward it to Bob.

There was a second technological problem that occurred. I had sent a prompt asking the participants to submit a topic for discussion to the group. Andrea sent her topic to me, and I forwarded the message to the other participants, however, the "message" the participants received was a blank page (which I discovered afterwards when it was too late to remedy the situation). I am not sure where the glitch was in the system. I do not know if it was related to Andrea's e-mail, to a problem with the university's network, or to an error on my part. To my knowledge this was the only message that was not properly dispatched to the group of participants.

I alone experienced the third technological problem. The university's system went down on a day I was trying to confirm the time and place of a

classroom visit with one of the participants. I was able to contact the participant by phone, and the needed information was obtained.

The most significant obstacle to communication during the e-mentoring project was reported by both female participants. Both female participants stated in their exit interview that they found the lack of face-to-face contact distracting. When asked to compare this experience to any previous mentoring experiences in which she had participated, Betty replied "I guess it was less informal. You weren't looking at the person that was mentoring you. Or you weren't able" (Exit Interview, 5/11/00). She continued her thought saying, "I like the personal contact myself" (Exit Interview, 5/11/00). Andrea related similar feelings. She noted that the initial group interview was helpful to her.

> Andrea - I think it helped meeting them when we first got together that time to meet each other and had the first group interview. Because I had a face with everybody. And I think it probably would have bothered me if I didn't know...and I don't know why it is but it's just easier for me to communicate with somebody if I have a face to go with who I'm talking to. (Exit Interview, 5/15/00)

Neither of the male participants made any reference to the lack of personal contact.

Advantages of E-mentoring. Two of the advantages of e-mentoring were noted by Bob in his exit interview "...talking to people and e-mailing them was pretty nice. You didn't have to spend that much time or drive that much other than that once" (Exit Interview, 5/16/00). For this particular group of people time

and distance would not have allowed them to have regular discourse without the use of the Internet. The participants were spread across such a wide area that distance would have made regularly scheduled meetings throughout the semester inconvenient or impossible.

Technology does offer the possibility of a group meeting on-line. An examination of the times the participants were best able to interact shows this would have been difficult to accomplish. Table 7 displays the percentage of each participant's responses that occurred during two-hour time intervals. I am making the assumption that the participants responded when they had time to devote to

Table 7
Percentages of Responses by Time of Day

Time	Andrea	Bob	Tom	Betty
6 am		19 %		4 %
8 am	4 %			42 %
10 am	7 %	7 %	15 %	31 %
noon			33 %	4 %
2 pm	7 %		37 %	8 %
4 pm	4 %	56 %		12 %
6 pm	15 %	11 %	4 %	
8 pm	30 %	7 %	11 %	
10 pm	30 %			
midnight	4 %			

this project. Andrea tended to respond in the late evening from home; Bob responded most in the late afternoon and early evening from home. Tom sent his responses in primarily in the early afternoon from school, and Betty preferred doing her responses in the morning, also from school. The only common time period for the participants' responses was 10:00 am to 12:00 pm (noon). The table indicates that this was not a favored time for any of the participants. In fact, it was Bob's least used time period, and Andrea's second least used time period. Thus, finding a time period when all of the participants could be on-line at the same time would have been difficult. The use of e-mail through the Internet in this project eliminated the time and distance constraints from this group of people and helped make the project possible.

Topics of Interest to Participants. An examination of the responses to prompts from the different theme areas will establish the amount of interest the participants showed the various topics. Four different themes were presented during the course of the study: classroom issues, school policies, ethical concerns, and educational philosophies. Table 8 reports the average number of lines per prompt for the different theme categories. Notice that the longest responses for all the participants were in the ethical concerns category. Length of the response does not necessarily indicate more interest of the respondent or more depth of the response when considered alone. However, when compared to the lengths of responses in the other categories for each individual participant, it may indicate

that the respondent devoted more attention to the response. For three of the four participants the response lengths almost doubled between the shortest and longest responses in the various categories seeming to signify more interest in the topics

Table 8
Average Number of Lines per Prompt for Theme Categories

	Andrea	Bob	Tom	Betty
Average	12	7	6	9
Classroom Issues	12	5	4	9
School Policies	11	8	4	8
Ethical Concerns	19	8	9	16
Educational Philosophies	11	7	6	9

with longer responses. The quantitative data given here reflects the patterns I saw in my qualitative analyses. The participants' responses to prompts from the ethical category had more passion and depth of thought to them than their responses to prompts from other categories.

Another measure that can indicate a participant's interest in a topic is the length of time it takes him or her to respond to the prompt. Table 9 contains the average response time in days for the theme categories. Notice the shortest response times were for the ethical concerns category. These statistical measures do not establish or prove anything. They do, however, echo the patterns that I saw emerging from the data.

During the exit interview, I specifically asked the participants what was their favorite interaction, which one had the most meaning to them. Two of the participants, Andrea and Betty, replied that one of the discussions in the ethical concerns category was their favorite. They both recalled the discussion on whether teachers have private lives as being the most interesting to them. Compare

Table 9
Average Response Time (in days) for Theme Categories

	Andrea	Bob	Tom	Betty
Average	2	1	1	3
Classroom Issues	2	1	1	1
School Policies	1	.5	1	2
Ethical Concerns	1	0	.5	3
Educational Philosophies	1.5	2	2	3

A time of 0 days indicates response on the day the prompt was received.

Betty's response to the prompt "Do Teachers have Private Lives?" below with her response to "Comparison " a prompt that asked the group members to comment on the fact that the science teachers also thought of themselves as scientists whereas the mathematics teachers did not view themselves as mathematicians.

"Do Teachers Have Private Lives?"

Betty - In the first instance, the teacher was doing something illegal,

so I do believe that some consequence should follow. I do believe that teachers are held up to this higher standard of living, at least compared with other professions. And they rightfully should being that they are trying to set good "standards" for students. I guess the ultimate question is should they be held to this high standard? I had a picture on my desktop the other day that was of "questionable" nature. It was in a file and students are not supposed to use my computer. One student noticed the name of the file and asked what it was and I told him that it was a personal file. Another student opened the file and the picture came up. (no nudity or obscenities) They were all laughing and I realized what they had done. I was very embarrassed and I made the comment that I hope they don't think any less of me after seeing the picture. I had several students tell me that they thought more of me because they saw me as being "more human". Sometimes I think that students think that we act "too good" for them and don't relate well. This teacher made a bad choice, but is she a "bad" teacher because of that choice? The teacher that got his tongue pierced should not even be an issue. It's his tongue. Do they think that because teachers don't have their tongues pierced, other students will make the decision not to pierce their tongue based on the teacher. They do those things because it is "cool" not based on what the school or their parents think. I guess that what I am trying to say is that what we do on our own time is our business as long as it does not affect the way we teach. I do like to keep my personal life very discrete. If I want to do something, I always leave town so I don't run into anyone I know, besides the fact that there is nothing to do here. I don't think that I should have to, but that is just the way it is. I like to keep my private life private. And I may do things that some people may not approve of, but I always act very professionally at school. And I do think that teachers have a right to a private life just like any other individual who works in this country. But just like everyone else, we need to use good judgment. (10:49am, 4/12/00)

"Comparison"

Betty - I too feel that because mathematicians do more applicational

> work there is a distinction between the two because we are trying to teach the basics as well as some applications, but with science teachers it is more hands on and experiments are being performed so they are "scientists." I never did get the feeling at . . . [named university] that one was "better" than the other. (10:02am, 2/29/00)

Notice the questions that Betty asks herself in the first response and the depth of her answers even supporting her position by sharing a personal experience. In the second response, however, Betty gives her feelings on the subject, but does not question her answer or provide any support material. This difference in responses was common among the other participants' responses within the ethical concerns category.

The one major exception to the above comment was the interaction cited by both Bob and Tom as being most helpful to them. This discussion involved motivating students and has been described above and illustrated in Figure 5. Bob shared a problem with the group. Tom quickly responded, and Bob responded back to Tom. A couple of days later Tom replied back to Bob. Andrea responded to Bob's initial problem statement. Betty made no reply. This particular prompt had the most interaction between participants of any of the other prompts. The topic of motivation was one that was raised several times throughout the study.

The results seem to indicate that the areas the participants had the most interest in were the discussions on ethical concerns such as drug testing, rights of pregnant students, and privacy issues. These topics all stimulated thoughtful in-

depth responses that exhibited the authors passion for his or her position. The other area of high interest to the group members was how to motivate their students. After learning what methods the other participants were employing in their classrooms, the group members seemed relieved to discover that sometimes it was seemingly impossible to motivate some students and that other people were frustrated at their ineffectiveness to achieve their goals too. Both Andrea and Bob stated in their exit interviews that one area in their teaching practices they had noticed a change in was that they did not worry over the small details anymore. Andrea illustrated her new attitude with an example, "Like that one kid who won't turn in his homework. I'm not going to fight him anymore. If he's going to turn it in, he's gonna do it, and if not he doesn't or he won't; it's not because I told him to or not told him to" (Exit Interview, 5/15/00).

Community Building. One of my goals for the project was to get the group members to bond and form a community that would provide them support. When asked directly in their exit interviews if they felt they had become part of a group or community, two of the participants replied that, yes, they felt they were a part of a group. Tom said "...yeah, I think so...cause you were all reading the same thing and sending out responses on it and you knew you were all together in that" (Exit Interview, 5/17/00). There were also two members that did not feel they were part of a community. Bob responded "No I can't say that I did. It's not going to be one of those lasting long time relationships I don't think. It might be

an e-mail here or there. But that's about it" (Exit Interview, 5/16/00). However, both respondents not feeling that a community was formed did not think that it was necessary to have done that to get benefit from the study.

While the members did not agree on whether a community was formed, Table 10 illustrates that they did get to know one another fairly well. I asked each of the participants to give ten words that they felt described each of the other participants. Then I asked each participant in a separate prompt to give ten words that described him or herself. Notice the similarities, column wise of the different descriptions of that particular individual. The participants must have enhanced their level of knowing each other. Andrea admitted in her Exit Interview that she found herself reading different things and then wondering what a particular participant would have responded to the topic.

Overcoming Isolation. Another goal I had set for this project was to help beginning rural teachers overcome the feelings of isolation that are so commonly reported in studies (Collins, 1999; Hersh, Stroot, & Snyder, 1993; Thoresen, 1997). Only one of the participants, Tom, initially reported having any feelings of isolation during the initial interview before the project began. Tom taught in a consolidated school system in which he was the only teacher in his subject area, one of two male teachers, and one of two teachers that had classrooms in a portable building set-up outside the main school building. When asked if he felt isolated in any way Tom said, ". . . maybe just because I'm out in this building

Table 10
Participants' Descriptions of Each Other

Author	Person Being Described			
	Amy	Bob	Tom	Betty
Amy	honest, organized, motivated, fun-loving, trustworthy, dedicated, reliable, can't say no, extroverted, moody	free-spirited, humourous, determined, outspoken, un-reserved, opinionated (in a good way), intellectual, open minded, caring	conservative, solid, honest, driven, caring, problem solver, moralistically inclined, humourous, smart, witty	funny, sweet, honest, trendy, determined, open minded, trustworthy, solid, happy, relaxed
Bob	dedicated, realistic, open to ideas, smart, willing to help	smart, dedicated to my kids (students), realistic, funny, tough when needed	dedicated, smart, open to ideas, realistic, caring towards others	idealistic, dedicated, caring, cares about her students
Tom	very caring, good role model, careful, admits when wrong, good teacher	very intelligent, knows his rights, somewhat passive (about discipline), funny, nice guy	intelligent, caring, hard working, honest, faithful, late, trying to improve	knowledgeable, hard working, caring, willing to help, very good teacher
Betty	opinionated, friendly, student-oriented, dedicated, honest, straight-forward, sincere, passionate, caring, warm	opinionated, loyal, trustworthy, honest, straight forward, head-strong, fun, spontaneous, hands-on teacher, good communicator	straight-laced, dedicated, loyal, trustworthy, good natured, passive, laid back, hard working, knowledgeable, predictable	opinionated, easy-going, confident, realistic, knowledgable, open minded, goal oriented, stressed, flexible, hard worker

away from the main building and there's only two of us out in this little building away from the school and the rest of the teachers are in the main building" (Initial Interview, 1/11/00) during his initial interview. Throughout the interview he referred to his "little building" and being "out there by himself." He also stressed that ". . . there is only one other full-time male" and that he was the only teacher in his field ". . . so I'm pretty much the math teacher" (Initial Interview, 1/11/00). Ironically, when I asked him during the exit interview if participating in this study had helped to alleviate any feelings of isolation that he might have had, he replied

> Tom - I didn't feel any feelings of isolation really, because the guy that just came in . . . is the science teacher and he's in the same boat I am in really. So he's just like one of those people. He's just like Amy or Bill. He's a science guy and he's my mentor teacher for my first year. So I didn't feel really isolated anyway. (Exit Interview, 5/17/00)

This response seemed to indicate the previously reported feelings of isolation had been resolved and forgotten. The resolution may have been in part due to his participation, but other factors must be considered as well. Undoubtably, Tom and his mentor teacher had established a close bond during the course of the year, and Tom was probably more comfortable with him at the end of May (the time of his exit interview) than he was in January (the time of his initial interview). Also, Tom was most likely more confident as a teacher when I conducted the exit interview so he was less likely to feel overwhelmed by being away from the main school building.

The other participants also had conflicting reports on their feelings of

isolation. None of the other three participants reported having any feelings of isolation when I directly asked them during their initial interviews. They all reported having at least one person they felt comfortable talking to about any problems or frustrations they had. However, when I asked them during their various exit interviews if they felt participating in this project had helped them overcome any feelings of isolation that they had, they all responded in the affirmative. Bob said "A little bit yeah. It was nice to know that other people are out there doing the same thing I was. And not just in my little area in school. It was pretty nice" (Exit Interview, 5/16/00). Betty reported that she liked being able to vent freely "You know if I ever had any comments or a bad day I could get on and put that on there" (Exit Interview, 5/11/00). And Andrea commented that she felt topics were discussed that were not typically discussed among established teachers,

> Andrea - You know some of the stuff that you had us discuss amongst each other, you never hear. I mean they don't talk about that kind of stuff in school. It just seems when we're on a break whether it's at lunch or before school starts they're not interested in talking about school. It's more this kid did this to me in my class. More of the griping venting type. So that was nice to be able to do that. (Exit Interview, 5/15/00)

Once again conflicting results were communicated.

The end result was that one participant reported feelings of isolation at the beginning of the study then stated that he did not feel isolated ever in his teaching position at the end of the study. The other three participants asserted that they had

no feelings of isolation at the beginning of the study, but described the different ways their feelings of isolation had been alleviated as a result of participating in the study during their exit interviews. The issue of support for early career teachers will be further explored in chapter five.

Summary

This chapter has discussed the results of the e-mentoring project described in Chapter 3. The design of the study evolved as the project progressed. The inability or unwillingness of the group members to participate in the original activities that I had planned forced me to reevaluate the goals of the project and to implement new strategies to encourage the participants to interact. Midway through the project I realized that I would have to play a major part in the listserv. The participants tended to submit prompts to the group only when I asked them to do so; consequently, I ended up providing the majority of the prompts to the group members.

The group members' T-BASM (Fleener & Nichols, 1994) scores demonstrated the homogeneity of the group. Average number of lines per response, average response time, and percentages of responses by time of day served to illustrate the essence of the interactions. The favored topics of the group were the ones dealing with ethics. The responses to the prompts on ethical questions exhibited an interest and a passion not seen in the responses to the

prompts in other areas such as school policies or educational philosophies.

The participants had little trouble using the available technology to communicate. However, one member was unable to directly e-mail another member on one occasion, and one message was not properly routed to all members of the group. I alone was the victim of a system failure that restricted my e-mail use for a day. One of the more interesting results uncovered was that both female participants reported missing the face-to-face contact they had in a traditional conversation when they communicated with the group members via e-mail. The use of e-mail to convey messages, however, eliminated time and distant constraints that would have made it difficult for this particular group of people to meet on a weekly basis.

The strong bond among group members that I had hoped would develop never did though all the members reported that they received benefits from participating in the study. Chief among the benefits described by the individual participants was the realization that each of the other participants was struggling with problems and issues similar to the reporting participant's own difficulties. Interestingly while only one participant reported having any feelings of isolation in his or her teaching situation at the beginning of the study, all the participants related feeling less isolated as a result of participating in this project. Chapter 5 concludes this paper with a discussion of these results, implications for future e-mentoring projects, consideration of the limitations of the study, and suggestions for future research.

CHAPTER FIVE

DISCUSSION

The goal of this project was to determine if support could be provided to early career teachers using on-line mentoring. Beginning teachers in rural settings were specifically targeted because of their vulnerability due to isolation caused by distance. The lack of other teachers in the same subject area because of small faculties is another concern unique to small rural schools. The guiding question of this project was: What is the impact of e-mentoring on early career teachers in terms of curriculum support, teaching support, emotional support, and reflective activity? This chapter will discuss the finding of this eighteen week investigation and offer suggestions for future research.

Discussion of Findings

The participants for this project were all teachers in their first or second year of service and had teaching positions in rural school systems within a two hundred mile radius of the university. Additionally, they were all mathematics or science majors and graduates of the same university. The aim of the project was to help alleviate feelings of isolation that many beginning rural teachers have by forming a community via the Internet. Participation was limited to recent graduates from the same rural

university so they would already know each other and have a basis for shared experiences in their backgrounds. The theory was that the initial steps of community building would have taken place, building on prior shared experiences and backgrounds as the basis for initial feelings of trust and comfort, so that the focus could be on how the participants used the internet for support.

E-mail responses were the primary data source. Pre and post interviews were conducted, and classroom observations were made to provide additional information and triangulation. An ongoing analysis of the data collected was performed throughout the study to determine and pursue participant interests and needs and to help revise my initial questions as the study progressed. The group participated in various activities. The members responded to prompts from me and to famous educational quotes. They were given articles to read and web-sites to visit. The participants were most comfortable responding to weekly prompts from me and that became the main activity of the project. Some of the interactions that I had anticipated would occur did not and other aspects arose that I had not anticipated. An examination of these events follows.

Emotional Support. The participants particularly liked the fact that the messages illustrated to them that they were not alone in their struggles and that others had the same problems they were experiencing. The use of electronic communication by beginning teachers to provide emotional support is common in programs that have used e-mail as a component of a mentoring program (Beals,

1990; Eisenman & Thornton, 1999; Merseth, 1991; Thomas & Clift, 1996; Admiraal, Lockhorst, Wubbels, Korthagen, & Veen 1998). Merseth's (1991) research showed beginning teachers tend to use e-mail more for moral support than for exchanging professional ideas. Similarly, during an examination of a computer conferencing program used with student teachers and their supervisors, Admiraal, Lockhorst, Wubbel, Korthagen, & Veen (1998) noted that ". . . student teachers used computer conferencing primarily to exchange emotional support . . ." These studies all supported the findings of my current study that, when used, e-mail communications seem to focus on issues of moral support for early career teachers. While consistent with other research that suggests many early career teachers leave the profession in their first few years because of lack of support, it is unclear whether the kind of emotional support offered is of the same quality and kind as in more traditional mentoring programs.

Privacy Concerns. There was some reluctance on the part of the participants to share specific information about themselves, their schools, and their students. One reason for this may be privacy concerns. Andrea (Exit Interview, 5/15/00) noted in her exit interview that she felt all the group members were honest and trusted them, but she did not know who had access to the other members' computers and was concerned about sending sensitive material to the group. This concern seems to be justified. Sethna and Barnes (1999) investigated the prominence of university administrators monitoring faculty and

student e-mail messages. They found 58% of universities have electronic communications policies, and while few administrators read faculty e-mail, they have the right to do so. Another concern is from computer hackers, Galinsky and Schopler (1997) note that "Confidentiality can also be threatened because nonparticipants might be able to gain access to the telephone or computer linkages." Transmission of sensitive information such as the names, grades, or problems of students is something that should be done only with extreme caution, which raises the question of how security issues affect the e-mentoring experience. The positive side of this concern is that it may raise the level of professionalism of the participants.

Participants' Reluctances. The group as a whole turned out to be very homogeneous, and the participants were reluctant to challenge the other members' ideas or beliefs. Admiraal, Lockhorst, Wubbels, Korthagen, and Veen (1998) conducted a study that used computer conferencing with student teachers and their supervisors. They found that when the student teachers responded to other student teachers the responses were of four types: (1) expressions of empathy and emotional support, (2) descriptions of their own teaching experiences, (3) provisions of teaching tips, and (4) stimulations of other student teachers' reflections (Admiraal, Lockhorst, Wubbels, Korthagen, & Veen, 1998). The responses were predominantly of the first type. Rarely did the student teachers' responses fit into the last category of stimulating reflections. Admiraal,

Lockhorst, Wubbels, Korthagen, and Veen (1998) discovered that

> Student teachers reported that they found it difficult to write reactions in which the learning process of their peers was the central focus, such as asking for explanations, summarising, confronting or asking to explicate, generalize or structure their experiences.

They did find, however, that if the student teachers were required to end their messages with questions for their peers, the peers responses tended to be more reflective.

The participants of the study described here were reluctant to provide subjects for group discussion. Although they preferred for me to provide the topics, it was ironic that the items provided by the participants sparked more in-depth discussions than topics provided by me. A difficulty, however, was getting them to provide topics. Thomas and Clift (1996) noted a similar reluctance by the participants in their investigation of student teachers' perceptions of telecommunication to provide issues for discussions. Thomas and Clift (1996) suggest that one reason participants may not be comfortable submitting topics is trust. "Sending a message that elicits spontaneous discussion requires a trust that others will respond" (Thomas & Clift, 1996). They also note that "Students who perceive it not to be in their best interests to disclose even a minor problem may decide not to participate in this type of discussion" (Thomas & Clift, 1996). Which raises an additional concern that participants may have, some participants may be reluctant to contribute to discussions in a medium where their comments may become a permanent record (Thomas & Clift, 1996).

The participants' responses to each other reflects a concerns-based perspective of meaningfulness. By providing authentic and important issues at their particular developmental and career status levels, it was perfectly natural that they would be more responsive to each other's concerns. Similarly, that their primary concern was learning to adjust to their new careers, it was not unusual that they were reticent to provide topics engulfed as they were in the process of developing habits of practice. Unfortunately, however, developing habits of practice may interfere with their future efforts to develop habits of reflectivity. This may be where the interjection of topics by the researcher or outside mentor, while perhaps not as meaningful, may be important for helping them develop these habits of inquiry and personal reflection while also establishing habits of practice.

The participants were reluctant to comment on outside readings or visit web sites. One possible reason for this was the time constraints that both first year teachers felt. Betty, in particular, seemed to feel very overwhelmed by the high time demands of class preparation, paper grading, and activity involvement common to the first three years of teaching. She repeatedly said in her exit interview that she wished she had more time to complete activities (Betty, Exit Interview, 5/11/00). Hunt (1999) suggests another option for the lack of commentary from the participants. In his study, he hypothesized that the participants may not have been "active and sophisticated enough to read regularly

and feel disposed to participate actively" (Hunt, 1999). If this was the case, it would most likely be a factor of the participants youth and inexperience.

Koszalka (2001) in an article in the Journal of Instructional Psychology offers another possibility. She suggests that teachers' reluctance to explore web-sites for educational references may be related to their "mental state of readiness to adopt this new innovation" (Kosazlka, 2001). Her idea is similar to ones put forth by Hargreaves in Changing Teachers, Changing Times. Hargreaves (1994) writes that education is in transition from a period of modernity to one of postmodernity.

> Schools and teachers are being affected more and more by the demands and contingencies of an increasingly complex and fast-paced postmodern world. Yet their response is often inappropriate or ineffective – leaving intact the systems and structures of the present, or retreating to comforting myths of the past. (Hargreaves, 1994)

Suggesting that when confronted with significant change it is not uncommon for teachers to retreat to activities that are comfortable before beginning the change process. Koszalka (2001) reported that after engaging with colleagues in discourse about using the web as an educational resource teachers attitude toward adopting web activities rose.

Possible Impact of Participant Selection Process. A possible contributing factor to the limited interaction of the participants of the project may have been the participant selection process. As was noted in Chapter 3, specifically choosing participants is sometimes necessary in qualitative research especially if a particular

case is being examined. Since I wanted to explore how a particular university could provide additional resources to its recent graduates in mathematics and science education and since I wanted a group of people who already had shared experiences to build upon, it was a reasoned choice to solicit participation from recent graduates from the university in science or mathematics education. I enlisted the help of the mathematics and science teacher education coordinator because he knew which graduates had accepted teaching positions and where they were located. He helped me select the five original candidates. Two of those five declined to participate, so the mathematics and science education coordinator helped me select a sixth candidate who became the fourth member of the group that participated in the study. Despite shared experiences having graduated from the same university at relatively the same time, the fact that they did not have previous professional relationships or even significant relationships as students may have made the deliberate selection of participants moot.

Another factor in the findings and perhaps a contributing factor to the lack of passion or need for internet support may have been that the participants were not struggling in their first years of teaching. Half-way through the participatory data collection phase, I realized that the participants did not appear to have significant problems in their classrooms. My on-site observations confirmed this. None of the participants were having major problems adjusting to their new careers as teachers, and none were experiencing classroom issues that they were

not equipped to handle.

The participants relatively easy transition into teaching possibly affected the group interactions and their need for on-line peer-mentoring. Both the homogeneity of the group and their lack of need for support may have been factors resulting from the selection process. The teachers the mathematics and science education coordinator suggested were among the top students in their respective classes, had performed well in their student teaching experiences, and, of those involved in entry year programs, had or did successfully complete their entry year program. The group I chose was one that was not likely to need much outside support, and one that was likely to agree to participate in professional development activities.

Of the two original candidates that declined to participate, one left teaching before the start of the spring semester and the other appeared to be overwhelmed by the teaching experience. Both of these teachers were in their second year of teaching when I approached them, had successfully completed their entry year programs, and were teaching in the original district that hired them. They both appeared to have encountered problems earlier in their careers that caused them to both be less than pleased with their current situations. These are the beginning teachers that seem to need extra support, yet they both declined to participate.

Early career teacher attrition is a significant problem for school systems (Banks, 1999; Colbert & Wolf, 1992; Henke, Xianglei, & Geis, 2000). One out of

five beginning teachers in 1992-93 left teaching within the first three years of service (Henke, Xiangle, & Geis, 2000). One of the reasons maybe that frequently the most inexperienced teachers are assigned to the most demanding classes and often are given inadequate support (Colbert & Wolf, 1992). A quarter of the beginning teachers leaving education did so because they were not interested in or were dissatisfied with teaching (Henke, Xianglei, & Geis, 2000). Of the beginning teachers that leave education, the teachers who had received more pedagogical training and who had participated in induction programs were less likely to leave the profession (Henke, Xianglei, & Geis, 2000). The National Education Program (NEA) (2001) reports that mentoring programs with an intensive on-the-job-training approach are having success in supporting early career teachers and lowering teacher attrition rates in participating school districts.

Gender Differences in Communications. Throughout the course of the study, I noticed very clear divisions among the participants that seemed to occur by specific groupings. Andrea and Tom, the two participants who indicated they had strong Christian beliefs, shared similar opinions on the issue of teachers' private lives, and Betty and Bob shared similar opinions. The two junior high teachers Andrea and Tom said they felt comfortable having a multi-grade group in their exit interviews; while Betty and Bob the high school teachers reported they would probably feel more comfortable if the group had been restricted to the ninth through twelfth grades. In Chapter 4, I reported on one such division among the

responses of the mathematics teachers, Betty and Tom, and the science teachers, Andrea and Bob. I specifically pointed out the differences in the responses to the group members and asked each one to comment on them. Of particular interest to the outcome of this and any future research projects was the division that seemed to exist among the genders in their communication preferences.

Both female participants, Andrea and Betty, reported that they would have liked more personal contact with the other members. They felt that more face-to-face contact would have enabled them to bond with the other group members better and would have helped them to develop a sense of community. In her exit interview Betty made the following comment,

> . . . even though we met the one time being able to read their opinions over a screen is not the same as actually sitting and talking and arguing. Not arguing, but just having that personal interaction. I think it's a lot different over the computer. (Exit Interview, 5/11/00)

The males, Tom and Bob, on the other hand seemed to like the anonymity of the e-mail interactions. Bob said, "I'd say it was one of the better ones [mentoring experiences]. Just doing the talking to the people and e-mailing them was pretty nice."

The division in favored communication methods between females and males has also been found in current research (Briton & Hall, 1995; Burgoon & Dillman, 1995; Dennis & Kinney, 1999; Lemon, 1999). The works of Briton and Hall (1995) and of Burgoon and Dillman (1995) suggest that women's

communication styles encompass more nonverbal cues, such as facial expressions, hand gestures, and tone inflection, than men's. This might lead women to prefer more face-to-face interactions. Lemon (1999) notes that "clear gender distinctions are apparent" when samples of e-mail communication are studied. Dennis and Kinney (1999) note that women "may be more strongly affected by the lack of nonverbal cues in CMC [computer-mediated communication] than men."

In her book, What Can She Know? (1991) which details the development of a feminist epistemology Code extolls the virtues of a "middle ground" approach.

> . . . a well-mapped middle ground offers a place to take up positions of strength and maximum productivity from which exclusionary theories can be tapped critically and creatively for criticism and reconstruction (Code, 1991, 318).

By taking a stand on open middle ground, Code (1991) argues, the feminist would be able to pick and choose the best part of each resource that surrounds them, and they would also be able to allow for the diversity of people and of ways of knowing that is a central tenet of feminism. A similar philosophy could be adapted to e-mentoring. The benefits of face-to-face communication could be incorporated with the benefits of electronic communication by providing participants regular times and places for in person meetings; as well as, encouraging them to interact via e-mail in the intervals in between. Thus the advantages of traditional mentoring and e-mentoring could be used to offer a richer support environment for early career teachers.

Participants' Comments

Each participant was asked individually what he or she thought were the strengths and weaknesses of the program and what he or she would change. The theory of Guba and Lincoln in their Fourth Generation Evaluation (1989) advocates giving the stakeholders a voice in the results. The group members' ideas and concerns were solicited during the exit interview. See Appendix C.

The general feeling of the group members was that four or five members was about the right size for the group. Had it been too much larger, some members felt they would have trouble keeping track of who was who. Bob said "If you have more people then you have to keep track of more people . . . If you had too many more people, you would have to stop and think now is he the junior high math teacher or is he the junior high science teacher" (Exit Interview, 5/16/00). While others felt they would have become overwhelmed by the number of responses to read in a larger group and may have opted to participate only selectively. Betty remarked "I think the project would have been less helpful if more participants had been involved. That would have meant more things to read through. I think keeping it small helped cut down time" (Exit Interview, 5/11/00). All the group members, however, felt that enlarging the group to include the next year's set of beginning teachers would have been a good idea. The group members saw themselves as watching over the new initiates until they found their way at which time all the members reported they would leave the group. Bob

observed "You'd have the old guard kind of watch over the new people getting into it. And also I think as you get a little older and more experience you can tell them what's going on" (Exit Interview, 5/16/00). None of them felt they would need e-mentoring on a permanent basis.

Ironically, while all the members said they would like to invite beginning teachers from their alma mater to join the project and that they would like to serve as mentors to the new bunch, none of them wanted more experienced teachers included in their e-mentoring experience. Bob noted during his exit interview

> Sometimes the experienced teachers give you advice but sometimes they force the advice upon you and say this is the way I've done it for thirty years. This way is the only way it works, blah, blah, blah. With the new teachers in here we try different things and sometimes it works, sometimes it works better. (Exit Interview, 5/16/00)

Others did not want the experienced teachers to bring negativity to the group and dampen the enthusiasm of the early career teachers. Andrea recalled the attitudes of some of the experienced teachers in her high school, "There are some that [have an attitude of] you don't know what you are talking about because you haven't been doing what I've been doing for as long as I've been doing it" (Exit Interview, 5/15/00). She continued, "The same amount of experience kept us kind of at eye level with one another" (Exit Interview, 5/15/00).

The members' opinions varied on some topics. Some felt the group should have been comprised of only teachers of the same subject or only teachers of the same grade level. Tom desired more participants in the same subject level. He

said "I don't think the age level thing [high school vs junior high] made that much of a difference . . . And the science didn't really bother me, I just think it could have been better if we'd had all math or all science" (Exit Interview, 5/17/00). Others liked the fact that the group consisted of different, though related, subject areas and different grade levels. Andrea enjoyed the mixture "I liked everybody's input about the different age groups and subjects it kind of kept it more broad based and not significant to one certain area . . . a lot of our ideas were the same or on the same track but separated" (Exit Interview, 5/15/00).

They were divided on the appropriate time to start the project as well. The teachers in their second year of teaching felt starting in the Fall at the beginning of school would not cause any problems. Andrea said "I enjoyed it and I would have been willing to do it for a year" (Exit Interview, 5/15/00). The first year teachers, however, said they were too overwhelmed in August when school started to have participated in this project. Betty stated "The time factor, it just seemed like everything went so fast . . . I know it shouldn't but I like to put a lot of thought into things and I didn't feel like I had enough time to think. At least not as much as I would have liked" (Exit Interview, 5/11/00). They did all agree, however, that they would have liked to participate in this type of program during their student teaching experiences. They all expressed a significant need to have a place where they could vent their feelings without fear of repercussions. Andrea noted "for the most part they're [student teachers] kind of intimidated or inhibited

to ask them [supervising teachers] too much cause they [student teachers] think they're placed in a position where they're supposed to know how to do everything" (Exit Interview, 5/15/00). This raises interesting questions with regards to further research studies in this area.

Suggestions for Further Study

Several areas of e-mentoring need further study and questions remain to be answered. For instance, while the participants did know each other to a certain extent, a group that all graduated in the same year and were members of the same teaching methods course would have established better bonds prior to the e-mentoring experience and might interact more with each other. Additional research is needed to examine if a group of students from the same class would interact more than this group did. What types of prior relationships need to exist, if any, to generate rich e-mentoring interactions?

Beginning the project when the pre-service teachers began their student teaching experiences might have also been beneficial to the participants as each reported that they really felt the need for support when they were student teaching. Having only teachers in the same subject area and same grade level are also possibilities. Each of the above points warrants further research to answer questions such as: What mixture of participants provides the best support for the group members? When is the optimal time to start the e-mentoring experience?

What makes the student teaching experience so stressful that the participants of this study all felt the need for added support and what can be done to change it? How can e-mentoring work with current entry year programs?

E-mentoring was designed to fit the needs of rural school systems. In particular, it was hoped that the distance problem inherent in rural school systems could be eliminated by using on-line communications. An additional benefit was the elimination of time constraints due to asynchronous communication. However, questions of the benefits of e-mentoring to beginning teachers in urban schools should also be investigated.

Communication on-line added a dimension of anonymity to the conversations even though the participants knew each other to some degree. The lack of face-to-face contact may have been perceived as less confrontational by some members of the group. This was not true for the female participants. They both reported that they needed to be able to put a face with a name to make the interaction more meaningful to them. Questions of the gender neutrality of e-mentoring need to be addressed, as well as, questions regarding the value society places on electronic communication. These questions, along with others, need to be addressed, and additional research needs to be conducted so that all the benefits of e-mentoring can be claimed.

Conclusions

Universities need to do more to help their prospective teachers make the transition from student to teacher, especially for those students that elect to begin their teaching careers in a rural area. Rural schools are immersed in a culture unlike that of their larger urban counterparts, and consequently we must stop assuming that what works in the city will work in the country.

Teachers entering a rural school system are faced with many situations that they have not been prepared for. One of the biggest among these is isolation. Current technological capabilities provide convenient economical access paths for the university to maintain frequent contact with former students. E-mentoring is a beneficial tool that capitalizes on the current technology to provide beginning teachers with a much needed resource.

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APPENDIX A

ORIENTATION INTERVIEW QUESTIONS

Define Mentor.

Computer Literacy

How comfortable are you working on a computer?

What experiences have you had with Internet, e-mail, listservs?

Where is the computer you will be using located?

NWOSU

When did you graduate from NWOSU?

What was your favorite class at NWOSU? Why?

Who is your all-time favorite teacher? Why?

Where did you student teach?

Current teaching experience

Describe your teaching situation.

Tell me how your first semester (or Fall semester) went.

What were the high points?

What problems did you encounter?

What classes are you teaching?

What is your favorite class to teach? Why?

What is your most difficult class to teach? Why?

What have you done to alleviate the difficulties?

Tell me about a time when you had to discipline a student or a class — how did it go?

Who do you talk to when you are having a bad day?

How did you find this person? Do you consider this person to be a mentor?

Are you now, or have you ever, taught courses that are not in your subject area? If so, what were the circumstances that brought this about?

Professional Growth

What professional affiliations do you belong to?

What opportunities does your school provide to you for professional growth?

Rural Schools

What factors influenced your acceptance of your current teaching position?

Did you feel prepared to teach in a rural school system?

What problems do you have because you teach in a rural school system?

Do you live in the same town that you teach in? Has this caused any problems?

What benefits do you receive because you teach in a rural school system?

Do you feel isolated in any way at your current teaching position?

What are some areas that you have concerns about?

What do you hope to gain from this experience?

APPENDIX B

ORIENTATION SEMINAR QUESTIONS/ACTIVITIES

1. Discuss need for face-to-face meeting
   - -Help bond as a group
   - -Establish relationships

2. Have each person introduce him/herself
   - -Where from
   - -What level teach
   - -What subject teach
   - -How long been teaching
   - -Family
   - -etc.

3. Project Design
   - -I will give them an initial prompt to get a conversation going and will continue to prompt till they as a group take over
   - -Need to read e-mail at least 3 times per week and respond in timely manner
   - -All reading assignments will be contained in the e-mail message or the web address will be given (Won't have to look up any readings.)
   - -E-mail responses to whole group to mentor@nwosu.edu ; messages just for me to skbrintnall@nwosu.edu
   - -Group comments confidential
   - -Keep journal of reflections of project
   - -Provide an analysis of me at end of project
   - -Additional aspects of project
     - -Classroom observation
     - -Colleague interview about participant electronically
     - -Exit interview — discuss my analysis of you privately
       Exit interview may be individual at your school or group here at NWOSU

4. Sample Activity
   - -Respond to the following quote — "Students don't fail; teachers fail."

5. General Business
    -CONFIRM E-MAIL ADDRESSES OF PARTICIPANTS
    -HAND OUT STAFF DEVELOPMENT POINTS FORMS
    -COLLECT QUESTIONNAIRES AND BELIEFS SURVEYS
    -FIND OUT WHEN SPRING BREAK IS FOR EACH PARTICIPANT
    -Ask for questions

6. Lunch

APPENDIX C

EXIT INTERVIEW QUESTIONS

How did participating in this study benefit you?

What were the drawbacks of participating in this study?

What was the average time per week that you devoted to this study?

Were the time demands too high?

Did you have difficulty accessing the listserv at anytime? How did you correct the problem?

Compare this experience to any previous mentoring experiences you might have had.

Did you notice any changes in your teaching practices that you felt were a result of this study?

Which aspect of the study was the most helpful to you? Peer interaction, readings, discussion of readings, access to NWOSU faculty member, other.

On a couple of occasions I suggested that you go to a particular web-site and read something. Did you do this? If so why didn't you respond to the group? If not, why not?

Did participation in this study help to alleviate any feelings of isolation that you might have had?

What was the best interaction you had with the group? Why? (Which topic was most meaningful to you and why)

Would the project have been more meaningful if

- had more participants?

- strictly science or math? High school or junior high? Etc.

- had some more experienced teachers involved?

- been started earlier in year (Fall)? in career (during student teaching)?

Would you like to have participated in a group like this while you were student teaching or during your entry year?

Do you feel your beliefs changed any?

Was it helpful to have other people share that they were going through the same type of problems?

Did the offer of staff development points influence your decision to participate?

Even though you never asked for personal help was it reassuring to know that it was right "under your finger tips"?

How come you only responded to me directly and never questioned other members of the group on their comments?

Do you feel like you were part of a "community"?

Do you feel like you "bonded" with the other participants?

Do you think it was necessary to establish a bond of some type to receive benefits from the project?

Do you feel that you have grown professionally as a result of this study? If so how?

Do you feel that you have grown intellectually as a result of this study? If so how?

Do you plan to pursue a master's degree?

Do you think this project helped you in any way toward that goal (of getting master's degree)?

Would you say that you had a successful (first) year of teaching?

What was the main benefit you got from participating in this project?

If this project were to be continued next year would you be interested in remaining as a participant?

Did you receive enough benefits to warrant continuing this project next year or indefinitely?

If the project were to continue, do you think more participants should be included? Recent NWOSU graduates or current student teachers.

Do you have any other comments that you would like to make about the project?

APPENDIX D

DEMOGRAPHIC QUESTIONNAIRE

Name _____

Alias to be used _____

E-mail address _____ Phone Number (____)_____

Marital Status: Married Single Divorced Widow Sex: Female Male

Number of Children or Dependents _____

Name of Employing School _____

Town School is Located in _____

Hometown _____ Distance of School from Hometown _____

Number of Students in School ____ Average Number of Students per Class ___

Number of Other Beginning Teachers in Building _____

Number of Other Teachers in Same Subject Area in Building _____

Courses Teaching (Spring Semester) _____

_____

Extracurricular Activities that You Sponsor _____

_____

How long have you been teaching? _____

Participation in Entry Year Program

Previously Currently Not Applicable

APPENDIX E

TEACHER BELIEF AND ATTITUDE SURVEY IN MATHEMATICS
T-BASM

LEARNING/TEACHING/CURRICULUM

Rate the following statements from 1 to 5.
(1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5= strongly agree)
Circle only one.

Learning

1 2 3 4 5 1. Discussing mathematical experiences with peers facilitates learning.

1 2 3 4 5 2. Children learn mathematics best by figuring out for themselves the ways to find answers to simple word problems.

1 2 3 4 5 3. Much student mathematical confusion is due to lack of clarity in the teachers directions.

1 2 3 4 5 4. Students can not learn mathematics well unless they pay attention to the teacher.

1 2 3 4 5 5. Frequent drills on mathematics facts are essential in order for students to learn them.

1 2 3 4 5 6. Children can figure out ways to solve many mathematics problems without formal instruction.

1 2 3 4 5 7. Key words and other specific methods are effective ways for children to learn to solve word problems.

1 2 3 4 5 8. Even children who have not learned basic facts can have effective methods for solving problems.

1 2 3 4 5 9. Children can learn effectively when the teacher does not tell them if their answers are right or wrong.

1 2 3 4 5 10. Many students have difficulty learning mathematics because of their poor memories.

1 2 3 4 5 11. Students need much more repetition and practice in order to learn math.

1 2 3 4 5 12. Students' explanations of their solutions to problems are good indicators of their mathematics learning.

1 2 3 4 5 13. The goal of instruction in mathematics is best achieved when students find their own methods for solving problems.

1 2 3 4 5 14. The goal of instruction in mathematics is best achieved when students routinely produce correct answers to problems.

1 2 3 4 5 15. A good indicator of learning in mathematics is if a student can get correct answers for problems.

1 2 3 4 5 16. Children should be able to complete mathematics problems quickly.

1 2 3 4 5 17. Students clarify their thinking when they write down their understanding of selected mathematics topics.

1 2 3 4 5 18. A student's mathematical understanding comes from within and is unique to each individual.

1 2 3 4 5 19. Any activity planned for students will be understood to mean something different by each student due to different personal goals and cultural experiences.

1 2 3 4 5 20. Students' answers to paper and pencil mathematical problems indicate their level of understanding.

Teaching

1 2 3 4 5 21. Students need to work together in small cooperative groups where they have opportunities to share their mathematical thinking with other members.

1 2 3 4 5 22. It is important for students to be able to solve mathematical problems in more than one way.

1 2 3 4 5 23. It is important to cover all basic mathematics curriculum assigned to a grade if students are to be successful the following year.

1 2 3 4 5 24. Teaching short cuts and more efficient mathematical procedures allows students to learn more material in less time.

1 2 3 4 5 25. Children will not understand addition and subtraction until they have mastered some basic number facts.

1 2 3 4 5 26. Students should view their teacher as a facilitator of learning rather than the dispenser of knowledge.

1 2 3 4 5 27. Children should have many informal experiences solving simple word problems before they are expected to memorize basic number facts.

1 2 3 4 5 28. Teachers should tell children who are having difficulty solving a word problem how to solve the problem.

1 2 3 4 5 29. Teachers should use a carefully structured skills guide when teaching mathematics to insure each skill is mastered.

1 2 3 4 5 30. Children should be allowed to invent ways to solve simple word problems before the teacher demonstrates how to solve the problems.

1 2 3 4 5 31. Mathematics should be presented to children in such a way that they can discover relationships for themselves.

1 2 3 4 5 32. Most students cannot figure mathematics out for themselves and must be explicitly taught.

1 2 3 4 5 33. Teachers should encourage children to develop their own solutions even if they are inefficient.

1 2 3 4 5 34. When children ask for help, the teacher should show them a way to solve the problem.

1 2 3 4 5 35. Effective teaching requires rewarding right answers and correcting wrong answers.

1 2 3 4 5 36. Allowing children to discuss their thinking helps them to make sense of mathematics.

1 2 3 4 5 37. Teachers are most successful when children judge whether their own answers are right or wrong.

1 2 3 4 5 38. It is more useful to allow children time to explore some tasks thoroughly, than cover all of the curriculum material.

1 2 3 4 5 39. An effective mathematics teacher demonstrates the right way to do a problem.

1 2 3 4 5 40. An important part of teaching mathematics is to explain methods clearly and carefully.

1 2 3 4 5 41. When selecting the next topic to be taught, one must consider the logical organization of mathematics.

1 2 3 4 5 42. The structure of mathematics is more important for making instructional decisions than is the natural development of children's ideas.

1 2 3 4 5 43. The instructional sequence of mathematics topics should be determined by the order in which children naturally acquire math concepts.

1 2 3 4 5 44. When selecting the next topic to be taught, a significant consideration is what children already know.

1 2 3 4 5 45. A teacher must be firm, but can't be domineering.

1 2 3 4 5 46. Mathematics classrooms should be organized so that students can work quietly in their textbooks with as little distraction as possible.

1 2 3 4 5 47. Classroom can and should be arranged so the authority is centered on the teacher.

1 2 3 4 5 48. Good teachers can control their students.

complied by Fleener & Nicholas (1994)
adapted from Fennema, Carpenter & Peterson (1986)
and personal communication from Paul Cobb

APPENDIX F

FACILITATOR E-MAIL PROMPTS

During one of my interviews for a high school teaching position, the interviewer asked me how I defended the education profession when someone said "Those who can do; those who can't teach." I replied that I ignored such comments figuring if the person was ignorant enough to say such a thing then s/he didn't know what s/he was talking about. I didn't get the position so I am guessing the interviewer was looking for a different response.

Has anyone ever said the rather famous quote to you? What was your response to that person, or what would you have said to the interviewer?

The article Bob mailed said the parents were going back to the next school board meeting to see what punishment the teacher was going to get. Whose in charge of disciplining teachers in your district the principal or the school board?

The student teachers are finishing up their block course work and getting ready to go out into schools next Monday. We have four math students and two science students that will be doing their student teaching this semester.

Reflect on your student teaching experience and/or your first year's experience and write a letter to our math and science teachers that are on the block. Tell them how it really was for you -- the things that they don't tell you in education seminars. Tell them what it was like to be observed, and offer any suggestions you might have to take some of the fear out of it for them. Tell them anything that you think might be helpful to them.

I need this by Wednesday afternoon, so I can get the letters copied and delivered to the students.

I distributed your letters to the student teachers last Thursday. Today is their first day in the classroom. I will forward your letters so you can see what everyone

else wrote.

I have been reviewing some of my notes and I came across something peculiar. At the beginning of each interview I asked each of you to define "mentor," all of you gave similar definitions. Something to the effect of "a mentor is someone who provides you with support and ideas, offer suggestions on how to deal with particular situations, and listens when you have a bad day."

None of you said anything about sharing success with a mentor, nor did you suggest that the mentor might get something out of the relationship. What do you think about that?

Share one of the successes in the classroom with the group. Bragging on yourself is allowed. Too many times we concentrate on only negative things.

It sounds like you all have a lot of things to be proud of in your teaching. I don't know that I have one shining moment that stands out about all the rest, but I do have a lot of little successes. I especially like when "the light goes on" for a student, and you can see that s/he understands.

Tom mentioned working with some students who have disabilities in math and modifying their assignments so that they have some success. I read into it that the students had IEP's (Individualized Education Programs). Don't know if that is true or not, but it got me to thinking.

I remember having IEP meetings when I taught high school. I remember that it was like pulling teeth to get some of the parents to attend the meetings, and I remember being frustrated that I had 20 some other students in the class and were being required to make special provisions for one. Some of the provisions I was asked to make (guaranteeing that a students made a certain percentage on exams) I didn't agree with and felt that it invalidated their grade in the course.

My biggest problem with IEP's was how to implement them and maintain the student's privacy. For example, I had some students that took different tests than the rest of the class and they, the IEP students , made a big deal out of it and I was supposed to some how keep their status a secret. Get real.

I reread this and realized that you might get the idea that I am against IEP's. That

is not the case; I have always been more than willing to devote more time to a student who needs extra help. I just sometimes wonder how effective IEP's are. And how as a teacher I am supposed to provide different instruction for a student at the same time I deal with the rest of the class and keep the whole thing under raps.

What do you all think? How do you deal with special needs students in your classes?

I have just given my college algebra classes their first exam and now have some very unhappy students. Two in particular.

Case 1: A nontraditional psych major who has attempted the class two previous times. This student is quite irate that all majors are required to take college algebra. S/he feels that algebra will not be used in his/her life and does not see the need for the requirement. Student has missed three class periods in a TTh course. Assume the person is never going to use algebra ever again, is it legitimate to require a college grad to demonstrate competence in college algebra (the level of the course is not much higher than algebra 2 in high school). Do you think that college algebra is so difficult that student's who can make A's and B's in other courses can't even pass it. (I think the same questions should be asked of a freshman level science course like physical science.)

Case 2: This is a traditional student, in major unknown, who finished only 15 questions of a 20 question test. Became quite upset when I wouldn't allow extra time to finish the exam. My reasoning was that I couldn't allow extra time to all the students (since some may have a class immediately following my class) so I shouldn't allow extra time for all the classes. The majority of the students have finished by the end of the hour. Am I being unreasonable to think that a student with no known disability should be able to complete 20 questions that came straight from the previous homework assignments?

I have really been troubled by my 2 students and would appreciate any thoughts that you have. Incidentally, if you have any problems that you are struggling with feel free to let the group know. Someone probably has a perspective that you haven't had yet.

Do you distinguish between scientists and science teachers or mathematicians or

math teachers? If so how? Which do you see yourself as? Do you consider one to be more important than the other?

Did you notice that the science teachers Andrea and Bob didn't see a distinction between scientists and science teachers, but the math teachers Betty and Tom did. I must confess that I also distinguish between a mathematician -- somebody who researches math and a math teacher -- somebody who teaches math. I don't think one is more important than the other; there is just a different twist on what they do. I think of myself as a math teacher not a mathematician.

In the world of academia, there is a sharp distinction between mathematicians and mathematics educators with mathematicians tending to look down their noses at math teachers. I get the feeling that the sentiment is the same in any hard science. It kind of goes back to the quote "those who can do; those who can't teach."

Did you get this kind of feeling from any of your professors at NWOSU? Why do you think there was a division (between math teachers and science teachers) and the responses to the previous questions?

I thought we would try something different this week. I'll send a message to Andrea and have her send just her response to Bob who will send just his response to Tom. Tom will send just his response to Betty and Betty will send her response back to me.

I thought this would offer a change of pace and let you respond more to each others thoughts.

I think we can get 2 chains going. The one described above and one going the opposite way, i.e. Betty to Tom to Bob to Andrea.

I'd appreciate it if you would carbon copy me as you e-mail to each other.

Here is a list of everybody's e-mail addresses.

Omitted to protect the privacy of the participants.

Do you have any idea how much math and science teachers can collaborate? Have you ever participated in such a project? Do you think there is a need for

such a collaboration? Would it be possible given the time restrictions both during the day and during the semester?

Send only your response on. If you have a different idea or topic that you would like to address, please feel free to do so. The above is only a suggestion to get you started in case you draw a blank as to where to begin.

You might want to include the direction the e-mail is going so the 2 chains don't get confused.

Andrea - Bob - Tom - Betty

Given the recent school shootings, how safe do you feel in your classroom? What measures has your school taken to insure that you don't become a national statistic? Do you think rural schools have more to be concerned about with the availability of guns than urban schools? As I recall, the majority of the mass school shootings have occurred in smaller schools. They were not in the big urban schools in "bad" neighborhoods like might have been expected.

Send only your response on. If you have a different idea or topic that you would like to address, please feel free to do so. The above is only a suggestion to get you started in case you draw a blank as to where to begin.
You might want to include the direction the e-mail is going so the 2 chains don't get confused.

Betty - Tom - Bob - Andrea

This week I would like to do 2 things. First submit a thought, a question, a comment or article to the group. Second, respond to each of the submissions made by the other group members.

Hope you all have relaxing spring breaks. I'll keep sending messages since we all seem to have breaks at different times; jump in as it's convenient for you.

I do not know much about charter schools either. I went to the site Tom shared with us and searched on charter schools. I found this article that seemed to have some good info in it, there were lots more.

http://www.edreform.com/chater_schools/today/

The general feeling I got from the different places I looked was that charter schools are the solution to all of educations problems. I realize these site are probably a little biased.

I do have some concerns that maybe you can help me out with

-What students are going to charter schools? The best and brightest? If so where does that leave the public schools? Have you ever taught a class that was comprised entirely of students from the lower half of their classes?

-One article I read said that charter schools were getting state money for part of their funding. Do we really need more schools drawing out of the pot when there is so little in it for the schools that are already established?

Go to the site that Tom suggested and see what you can find out. Do you think charter schools are a good thing or a bad thing?
Here's the site http:www.education-world.com/

I remember giving Standardized Tests when I taught high school. We were told to watch the students and report any that weren't "putting forth much effort". We were supposed to watch for the ones that finished extremely early, as well as, the ones that colored in all the same letter on their answer sheets. We were supposed to report these students to the office, and they were then called out of class and talked to about the importance of performing to their best ability. I really don't think it helped their attitudes at all.

Are the students required to pass the tests to graduate, or are they used to measure how well the teacher is teaching?

Do you see any relationship between the Standardized Tests that you are giving to the students and the Competency Tests that you each had to take to get certified? Incidently, the math and science people that took Competency Tests this last time (with the new tests) didn't fair too well. If that had been you who would you blame -- the people that wrote the test, the people that taught the courses, yourself for not preparing well enough, etc?

You all seem to agree that drug testing the students is ok. What about drug testing

for the teachers?

On a similar note, when I was in high school if a girl was pregnant she was not allowed to participate in ANY extracurricular activities -- sports, cheerleading, music programs, club officers, etc. What do you think about that? Does your school have a similar policy? If so are we trying to protect the health of the girl and her unborn baby or are we trying to dictate moral standards?

I have another two-part discussion for you all this week.

(1) First share with the group some problem that you have had with a class, a parent, another teacher, etc. It could be something you have already resolved, or something that you are still trying to figure out.

(2) After reading each member's contribution, share with the group how you would handle the problem mentioned or how you have dealt with a similar problem.

Remember that EVERY teacher has had problems sometime during their teaching career.

It seems that most of you have had trouble motivating your students at one time or another. Share some of the things you have done in the past to get your students involved in the learning process.

I have finished my class observations; they provided me with a reality check. I had forgotten what it was like to have 20 adolescents in a room for 50 minutes. In all honesty, I had forgotten how hard it is to keep the students attention and to get them to do their homework assignments. You are all doing a fantastic job.

Betty has a different schedule than most of you (I think.) She has block scheduling on Tuesday and Wednesday and regular scheduling Monday, Thursday, and Friday. What do you think of rotating the schedule like that? What are your opinions on block scheduling?

You all seem to be in agreement that with upper level students the block schedule might have some benefits and also that for younger students the period would be too long. Why do you think so many schools have block scheduling? What are some ideas/techniques that you would use to keep our younger students on task during the long class period if you worked in a system that had block scheduling?

Bob made an interesting point when he said "many people think that the more time spent in a classroom the more you learn." my principal decided one year that he would add 5 minutes to the class period length making it a 55 minute hour instead of a 50 minute hour. By doing this, he explained, he was essentially adding a class period every 2 weeks. So by the end of the year we would have an additional 18 class periods and should be able to cover one or two more chapters. What do you think of his reasoning?

I was watching Dateline on NBC the other night, and they had a piece on a teacher who had lost her job because she had attended a "sex club." The teacher was well liked by students, parents, and colleagues. The place she went to was a restaurant with drinking and dancing and mattresses along the walls where patrons could engage in sexual activities while others watched. She went on a weekend night and was at the establishment when it was raided. I don't know if she was sent to jail or had to pay a fine or what. Anyhow when it got back to school she was suspended and ultimately fired (I believe). The teacher said she never would have gone to the club if she would have known she could lose her job over it.

On a similar note, I heard on the radio about a middle school teacher that got his tongue pierced over spring break and was going to have to appear before his board to justify what he had done. The reporter seemed to indicate that there might be negative consequences for the teacher.

What do you think about all of this? Are you a teacher 100% of the time? Do you have to behave as a role model all the time? Do you have a right to a private life?

I must admit that I share some of Betty and Bob's sentiments. There were some things that I would not do in Alva when I taught at the high school that I did in other places. For me the problem was buying beer. I don't even like to drink the stuff, but my father does. Does buying beer in another town make me a hypocrite? It is kind of like I was telling the whole town that I didn't ever buy beer, but in reality doing it -- only secretly? I was over 21 so it was legal, but it

still seemed to set a bad example for the students.

What do you think? Are we being hypocrites when we go out of town to engage in a behavior that is legal but that some people disapprove of?

How do you define learning? i.e. What does it mean to learn? How do you measure learning?

Now that you have defined what it means to learn, the next logical question is what does it mean to teach?

What is your philosophy of education? Did you have to write your philosophy for an education class while you were at NWOSU? Has it changed significantly now that you have your own classroom?

The Spring semester is quickly winding down and we have some decisions to make and rap-up activities to do.

1. Do you want to have another group meeting? This is entirely up to all of you. I realize that your schedules are really busy at this time and ending group meeting is not mandatory, but if you want to get together and discuss how things went we can certainly do that.

2. I need you to pass a survey along to a person, preferably to some one that works in your school system. The added information will help me achieve validity in my final write-up. See second e-mail.

3. I need to have a final interview with each of you. I am free anytime from May 11-May 20. (We are conducting a math summer academy May 21-May 26 so I really need to be finished with the interviews by the 20th.) Let me know a day and a time that would be convenient for you and I'll meet you at your school.

I have one more topic that I would like you to respond to. I'll send that out next week. Thanks for all your help so far.

P.S. For those of you teaching in Oklahoma, we still have a couple of openings for our summer academy. If you have any students that are interested in math and/or math technology and would like to participate in a week long academy at

NWOSU (we house, feed, and entertain them -- they pay nothing) Let me know and we'll get some information to them.

Please pass this survey onto a colleague that you feel comfortable with to have him/her evaluate you. You can forward the e-mail and then ask that s/he forward it to me at skbrintnall@nwosu.edu or you can print the message and have him/her mail it to me at Sheila Brintnall, Mathematics Department, NWOSU, Alva, OK 73717.

****

My name is Sheila Brintnall and I am conducting a research project on the feasibility of mentoring on line for my dissertation at the University of Oklahoma. _____ is participating in my project and has given me permission to solicit your responses to the following questions. If you want additional information please call me at (580) 327-8582.

What is your name and position?

How long have you been in education?

What is your relationship to _____?

What do you perceive to be _____'s strengths?

What weaknesses do you believe that _____ has?

How is _____ received as a faculty member?

What do the students think of ____?

Is _____ an effective teacher?

Is _____ a leader or a follower?

Does _____ readily join groups?

Did you notice any changes in _____ during the Spring semester?

This is the final response that I am going to ask you to do; however, you are welcome to continue e-mailing each other via "mentor" if you like. This last exercise will be private. I will not be forwarding the messages to the whole group.

Choose 10 words for each of the other members of the group that you feel describes him/her.

Thanks for your help! I'll be seeing you for the wrap-up interview.

The general inclination of the group is that no one really objects to having a final group meeting, but everyone is very limited time wise. Since no one indicated that they felt it was necessary to have a final group meeting so that they could achieve closure from this project and since everyone is so busy with end of the year activities, I think we should forego the final group meeting.

I have only received one of the colleague surveys; would you please check with the person you gave it to, to see if they have had a chance to complete the survey yet. I know once school is out that getting a hold of people will be a nightmare. Thanks for your help.

It just occurred to me that it would be helpful to know how you view yourselves. If it's not too much trouble, could you e-mail me with 10 words that you feel describe yourself? I just want to compare your words with the words the others used to describe you.

Thanks!

APPENDIX G

IRB EXEMPTION LETTER

See Next Page.

The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

COPY

December 14, 1999

Ms. Shelia Brintnall
1217 Locust
Alva OK 73717

Dear Ms. Brintnall:

Your research application, "E-mentoring: A Case Study of the Viability and Benefits of Electronic Mentoring with Beginning Teachers in Rural Schools," has been reviewed according to the policies of the Institutional Review Board chaired by Dr. E. Laurette Taylor and found to be exempt from the requirements for full board review. Your project is approved under the regulations of the University of Oklahoma - Norman Campus Policies and Procedures for the Protection of Human Subjects in Research Activities.

Should you wish to deviate from the described protocol, you must notify me and obtain prior approval from the Board for the changes. If the research is to extend beyond 12 months, you must contact this office, in writing, noting any changes or revisions in the protocol and/or informed consent forms, and request an extension of this ruling.

If you have any questions, please contact me.

Sincerely yours,

Susan Wyatt Sedwick

Susan Wyatt Sedwick, Ph.D.
Administrative Officer
Institutional Review Board

SWS:pw
FY00-116

cc: Dr. E. Laurette Taylor, Chair, Institutional Review Board
Dr. M. Jayne Fleener, Instructional Leadership & Academic Curriculum

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