USING TECHNOLOGY IN MENTORING RELATIONSHIPS: CONSIDERATIONS OF ONLINE MENTORING FOR PROFESSIONAL DEVELOPMENT

by

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(Under the Direction of MICHAEL A. OREY)

ABSTRACT

Through the use of computer-mediated communication (CMC), possibilities exist to create mentoring relationships between individuals separated by distance. These possibilities have resulted in a recent explosion in the number of online mentoring programs that exist. Ensher, Heun and Blanchard (2003) stated that the number of online mentoring programs grew significantly in the first two years of this century. Despite this growth, research has not kept pace to ascertain the unique opportunities and challenges associated with online mentoring (Bierema & Merriam, 2002; Ensher et al., 2003).

The purpose of this dissertation is to address three research questions regarding online mentoring in the professional development of pre- and in-service teachers. First, how do prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs? Second, what are the affordances offered and constraints posed by various forms of CMC on mentoring relationships for teachers? Last, how does CMC impact the access to mentors for teachers?

A group of pre- and in-service teachers completed an online survey. Interviews were conducted with a subset of the online survey participants. Building Resources: An Inductive Design for Georgia Educators (BRIDGE) was specifically considered in the interviews.

Willingness to participate in an online mentoring program may increase when the online mentoring program provides opportunities for reciprocal learning between mentor and protégé. Participants described instances in which face-to-face mentors addressed their professional needs. In these cases, the participants were less inclined to seek help from online mentors.

Although e-mail does not provide information like tone of voice, e-mail was described as the most common form of CMC. The participants expressed a willingness to learn more about video teleconferencing. One of the chief constraints to video teleconferencing was lack of access to this form of technology. Recommendations are made in the dissertation regarding providing access to online mentors to improve standards-based reforms described in Wang and Odell (2002).

INDEX WORDS: Online mentoring, Professional development, Social exchange theory, Computer-mediated communication, Social presence

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A Dissertation Submitted to the Graduate Faculty of The University of Georgia in Partial Fulfillment of the Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2006

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DEDICATION

This dissertation is dedicated to my wife, Kay. Her love, support and patience have been indispensable in both my academic and professional career. My doctoral degree is certainly one that belongs to both of us. Words cannot adequately express my love and appreciation for Kay's patience in helping me obtain my doctorate.

ACKNOWLEDGEMENTS

I appreciate all the help and guidance I received from my major professor, Mike Orey. He not only spent many hours helping me in the development of this dissertation, but he also provided me with many opportunities to grow as a researcher. Additionally, the help of my committee members: Tal Guy, Janette Hill and Lynne Schrum, was invaluable. I will always value their friendship, feedback and instruction they provided me during this process. I count myself blessed for the friendships I have developed with the entire faculty and graduate study body within the department and the College of Education as a whole.

In addition to the support of my wife, I want to take the time to express my gratitude to my entire family. My decision to leave my job as an engineer to pursue my Ph.D. was a difficult one that I could not have made without the support of my family. I want to take this opportunity to publicly acknowledge the support of my parents (Johnny and Janice Thomas), Kay's parents (Charles and Raynelle Sims), my brother-in-law and his wife (Phil and June Sims) and my niece and nephew (Hannah and Parker Sims).

Many thanks go to Judy Milton and Ellen Ensher for their help in preparing the survey. I appreciate all of Judy's help in making the distribution and collection of the survey data a very seamless process. Ellen's comments were very helpful in the early development process of the survey. I appreciate Ellen's time in discussing her research in the area of online mentoring.

I appreciate the support and encouragement I received from Brenau University. Helen Ray, the Vice President of Academic Affairs, always provided words of encouragement during the doctoral process. The faculty within the mathematics and science department (Terry Barron,

Nisa Blackmon, Louise Bauck, Jeanine Blachly, Jane Broaddus, , John Dittmer, Andrei Galiautdinov, Carolyn Giberson, Joe Greene, Steve Hatfield, Randy May and Gale Starich) was always there to provide emotional support in my dual role of doctoral student and professor. I also thank God for all the many blessings he has given me and his provision of this wonderful learning experience.

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PROLOGUE

The purpose of this prologue is to describe the rationale for the topic I chose for my dissertation. I describe the rationale for the three dissertation questions I addressed. In addition, I provide a brief overview of the methodology I used in conducting my dissertation study.

The literature has described the benefits of mentoring programs for the professional development of new teachers (Dove, 2004; Haack & Smith, 2000; Millinger, 2004). The benefits mentors have provided to new teachers include providing emotional support and helping new teachers improve their teaching practice. Face-to-face mentoring relationships restrict the mentor and protégé to interaction that occurs only when the mentor and protege are at the same place during the same time. Computer-mediated communication (CMC) has the potential to remove the restriction of interaction while the mentor and protégé are in the same location. For instance, the mentor and protégé might exchange e-mails with one another. They could read and respond to these messages according to their own schedules. The use of CMC in mentoring relationships is commonly referred to as online mentoring, telementoring or e-mentoring. Despite the potential of online mentoring, much of the "evidence" regarding online mentoring is anecdotal, and further research is necessary to substantiate the ability of CMC to support mentoring relationships (Ensher, Heun, & Blanchard, 2003).

The purpose of this dissertation study is to explore three research questions regarding online mentoring for the professional development of teachers. First, how do prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs? Second, what are the affordances

offered and constraints posed by various forms of CMC on mentoring relationships for teachers? Last, how does CMC impact the access to mentors for teachers? These questions were developed during the course of my literature review. Questions 1 and 3 are a subset of research propositions made by Ensher et al. (2003). Although the literature did describe the application of listservs (Singer, 2005) and discussion boards (Merseth, 1991) in online mentoring, e-mail was the primary focus in the literature for online mentoring (Abbott, 2004; Duff, 2000; Ensher et al., 2003; Sanchez & Harris, 1996). The purpose of the second research question was to explore the possibilities offered by several forms of CMC to online mentoring.

Quantitative and qualitative data were collected in addressing the three research questions. An online survey was used to collect quantitative data regarding pre- and in-service teachers prior experiences with mentoring, CMC and their perspectives regarding online mentoring. Forty-eight individuals participated in the online survey. The composition of the online survey participants included thirty-one in-service teachers; sixteen pre-service teachers and one participant did not specify his/her status. At the end of the online survey, participants were asked if they would like to participate in an individual interview. Qualitative data was collected through tape-recorded interviews. The interviews were semi-structured and addressed the participant's perspectives regarding prior mentoring relationships, prior CMC experiences and their interest in online mentoring relationships. The interviews were subsequently transcribed. Six individuals participated in the interviews. The composition of the participants in the interviews included three in-service teachers and three pre-service teachers.

Building Resources: An Inductive Design for Georgia Educators (BRIDGE) is an online resource for teachers regarding the teaching standards. The BRIDGE is one of the initiatives of the Georgia Systemic Teacher Education Program (GSTEP). During the interview process, the

BRIDGE was discussed while addressing the third research question. Interview participants were asked if they would use the BRIDGE, the manner in which they would use the BRIDGE and improvements they recommended for the BRIDGE.

I use descriptive statistics from the online survey to address research questions 1 and 2. These descriptive statistics included frequencies of the number of participants that responded either yes or no to various questions (e.g., willingness to be an online mentor). I additionally included sample means for Likert-scale responses to perspectives regarding various forms of CMC. Qualitative analysis was used to address the three research questions in the study. During the transcription process, I placed the data into four categories: mentoring, CMC, online mentoring and BRIDGE. I developed codes under each category. I used Nvivo 2.0, a Computer-Aided Qualitative Data Analysis Software (CAQDAS) package, during the coding and searching process. In addressing research question 1, I looked for relationships between the categories mentoring, CMC and online mentoring. In addressing research question 2, I looked for relationships between the categories mentoring and CMC. For research question 3, I looked for relationships between the categories mentoring and BRIDGE.

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CHAPTER 1

INTRODUCTION

The origins of mentoring

The term mentor originated in Greek mythology. Homer coined the term mentor in his epic, The Odyssey. In the Odyssey, Mentor was a good friend to Odysseus, the king. When Odysseus left to fight in the Trojan War, Odysseus left the training and counsel of his son, Telemachus, in the hands of Mentor. From the basis of this story, mentoring embodies an individual that acts as a role model, counselor and guide.

The world of the ancient Greeks may seem like an odd place to consider technology, but the potential impact of technology on Mentor's and Telemachus' relationship provides a background in addressing the title question of the chapter. Without the aid of telecommunications technology, mentoring relationships of the ancient Greeks were limited to face-to-face contact. How would e-mail, instant messaging or video teleconferencing impact Mentor and Telemachus' interaction? Physical separation would no longer constrain the possibilities for interaction, but what might they lose?

Additionally, could Odysseus while fighting in the Trojan War have used computer-mediated communication (CMC) to connect to Telemachus? Some might say a computer-mediated relationship between Odysseus and Telemachus may eliminate the need for Mentor. Some might say CMC may create the possibilities for Telemachus to receive dual mentoring from both Mentor and Odysseus. As we consider these possibilities, we must not lose sight of the ultimate goal of Telemachus' mentoring relationship: to prepare him to be the next king. The manner in which CMC would enhance or constrain Telemachus' and Mentor's relationship lies in the capability of CMC to meet the goal of preparing Telemachus to be the next king.

The purpose of this paper is to describe the application of CMC into mentoring relationships in today's world. During the course of the paper, I will describe the goals of

mentoring relationships. Additionally, I introduce three theoretical frameworks for researching mentoring relationships conducted through CMC. I use these theoretical frameworks to offer some suggestions for the development of mentoring relationships using CMC.

Goals of mentoring programs

Jacobi (1991) provided a listing of several different definitions of mentoring from the research literature. Two important goals are contained in these definitions. First, mentors should provide emotional or psychosocial support to protégés. Second, mentors should help protégés develop skills for professional development. Although these are important goals of mentoring programs, I would propose two additional goals in light of the challenges some professions face. A third goal is that mentoring relationships should address problems of high attrition that exist in some professions. Last, mentoring programs should help professions that lack diversity in terms of gender, race or ethnic origin.

Providing Emotional Support

Newcomers to a profession are bound to face some stresses as they encounter new environs (Millinger, 2004). Pressures for the newcomer to the profession to make a good initial impression are strong. In dealing with these stresses, newcomers desire the emotional support a mentor can provide. When this emotional support is missing, protégés often notice this important missing element. For example, Murrell (1999) found that many women lack the emotional and psychosocial support they desire in mentoring relationships.

Definitions of mentoring from the research literature describe the importance of the mentor providing emotional support to the protégé. Olian, Carroll, Giannantonia and Feren (1988) defined a mentor as “a senior member of the profession who…shares emotional support”

(p. 16). Several of the definitions of mentoring contained in Jacobi (1991) used terms like supportive, psychosocial support and nurturing.

Helping Individuals Perform Successfully in Profession

Mentors are often seen in the role of providing emotional support (Jacobi, 1991; Murrell, 1999). Although the value of emotional support is important, other measures are important in mentoring relationships. For instance, Wang and Odell (2002) noted that many teacher mentoring programs focus on providing emotional support at the expense of preparing teachers to learn to teach. Marra and Panghorn (2001) described the need for mentors of engineers to encourage a wider base of learning than just mathematics and science. In their view, engineering mentors should encourage undergraduate engineers to build skills in writing and reading as well as calculus and physics. These skills will allow the engineer to communicate effectively with non-engineers. The mentor must help the protégé develop the necessary skills to function within the profession (Billingsley, 2004; Haack & Smith, 2000; Millinger, 2004).

King and Denecke (2003) noted the importance of the academic advisor's role as mentor in helping graduate students build necessary research skills. They stated, "Rather than being concerned solely with the student's completing the dissertation or developing technical competence, the mentor is concerned with promoting a broader range of psychological, intellectual, and professional development" (p. 15). They further describing some specific skills the advisor/mentor should build like writing grants and managing budgets. This is important because

> numerous research studies have found that graduate students are poorly prepared to teach; are unfamiliar with faculty governance and service; have no idea what is involved in managing a lab, procuring grants, managing budgets or directing student research; and

> are unable to explain their research to anyone outside their own discipline. (King & Denecke, 2003, pp. 18-19)

High Attrition Rates in a Profession

Some professions face the challenge of dealing with high attrition rates of newcomers to the field. The teaching profession is estimated to lose anywhere between 30 to 40% of teachers within their first five years of teaching (Dove, 2004; McGlamery & Edick, 2004). Several researchers (e.g., Billingsley, 2004; Dove, 2004; McGlamery & Edick, 2004; Millinger, 2004) described the value of mentoring in relieving some of the stress that beginning teachers face.

The issue of high attrition rates is an ongoing issue for doctoral programs (Golde, 2000; Johnson, Green, & Kluever, 2000; Moyer & Salovey, 1999; Nolan, 1999). Herzig (2002) cited that the estimated proportion of mathematics students that do not complete their doctorate ranges from 30 to 70%. High attrition rates were compounded by the fact that 20% of all doctoral students that do not complete their degrees are in the dissertation phase of their studies.

Mentoring offers some possibilities in addressing the high attrition rates of doctoral students. In a study conducted by Moyer and Salovey (1999) to address high attrition rates of doctoral students, 13% of respondents suggested improvements to the mentoring process. Herzig (2002) also described the benefits of mentoring in dealing with the high attrition rates of doctoral students in mathematics. By acting as role models, he believed that mentors could display visually the skills necessary to be successful as a mathematical researcher.

Encouraging Underrepresented Groups

Under representation of demographic groups within some professions presents special challenges. For instance, under representation of women in mathematics and science is an ongoing problem (Holland & Eisenhart, 1990). This disparity is particularly glaring when we

compare the gender breakdown of physical sciences to biological sciences. In the year 2000, approximately 45% of biologists were females. In contrast, approximately 9% of engineers were females in the same year (United States Census Bureau, 2002). Disparities within a profession may limit the diversity of ideas that exist within that community.

Holland and Eisenhart (1990) explored the gender disparity that existed in mathematics and science in the 1980's. Although the bulk of their study focused on the culture of romance that existed within the undergraduate setting, they did find that mentoring was a useful piece of the puzzle in addressing gender disparity. They found that the most likely women to remain in science-career fields were those that formed mentoring relationships with their professors.

This is not to say that challenges do not exist with respect to using mentoring to help underrepresented groups. In many cases, the persons in senior positions to mentor women are men (Hansman, 2002). Although men can serve as mentors to women, certain challenges face cross-gender mentoring relationships. Crotty (1998) stated that some feminists believe men do not have the experiences of women to fully understand the issues facing women. Holland and Eisenhart (1990) noted that the possibility for misunderstanding regarding romantic overtures is always present in cross-gender mentoring relationships as well. Some of the women in their study described experiences of unwanted sexual overtures from male mentors. A male mentor should actively seek to understand the unique challenges his female protégé faces.

Theoretical Frameworks for Researching Online Mentoring Programs

As discussed in the previous section, four goals are important considerations for mentoring programs. These four goals establish the basis for four important research questions regarding the effectiveness of online mentoring programs.

1) Does the online mentoring program provide emotional or psychosocial support?
2) Does the online mentoring program promote the development of skills for members of the professional community?
3) Does the online mentoring program treat issues of high attrition within the professional community?
4) Does the online mentoring program provide support to underrepresented groups within the professional community?

Jacobi (1991) described a lack of theory-based research that existed with respect to mentoring research. She felt this was problematic because little basis existed to interpret the results of the large volume of mentoring studies conducted at the time. Research regarding online mentoring faces a similar dilemma. Ensher, Heun and Blanchard (2003) described the recent growth in the number of online mentoring programs in existence. Despite this growth, much of the "evidence" regarding the value of online mentoring is anecdotal (Bierema & Merriam, 2002; Ensher et al., 2003; Guy, 2002). In this section, I describe three theoretical frameworks (social exchange, power and social presence) that I believe are useful lenses for researching online mentoring. I believe these three theoretical frameworks provide a basis for researching the ability of CMC to support the four goals of mentoring programs: proving emotional support, promoting the development of professional skills, treating problems regarding high attrition and supporting underrepresented groups.

Social Exchange Theory

Social exchange posits that benefits must be mutually beneficial to the mentor and protégé for the mentoring relationship to last (Ensher et al., 2003; Jacobi, 1991; Vo-Thanh-Xuan

& Rice, 2000; Wilson & Elman, 1990). Jacobi (1991) defined the notion of social exchange theory as "The mentor as well as the protégé derives benefits from the relationship, and these benefits may be either emotional or tangible" (p. 513). Vo-Thanh-Xuan and Rice (2000) observed social exchange theory at work in a study where grandparents mentored their grandchildren. The grandchildren (protégé) benefited by getting to know their grandparents better. The grandparent's self-esteem improved as they realized they could make a positive contribution to society. Schrum, Skeele and Grant (2002-2003) noted the reciprocity present in many teacher education programs. Cooperating teachers shared their experience with pre-service teachers, and pre-service teachers taught in-service teachers about technology.

While using social exchange theory, gaining an understanding of the specific benefits that participants in online mentoring relationships seek is important. Aryee and Chay (1996) researched the motivation of managers to participate in mentoring relationships. Extrinsic motivators were employee development-linked reward systems and opportunities for interactions on the job. Intrinsic motivators were altruism and positive affectivity. Positive affectivity is the ability to maintain a positive outlook despite external circumstances.

Social exchange provides a lens for considering reciprocity of benefits through CMC with respect to the four important goals of mentoring. First, can both the mentor and protégé receive emotional support within an online mentoring relationship? Second, can online mentoring provide an environment in which both the mentor and protégé can develop professionally? High attrition rates within a profession adversely impact that profession. Can online mentoring provide a setting in which the professional community will benefit through reduction in attrition while benefiting the online mentor and protégé? Can online mentoring benefit both underrepresented and mainstream members in the profession?

Structure of Power in Mentoring Relationships

Hansman (2002) noted the paradox that existed in mentoring relationships with respect to power. Mentors hold the greatest degree of power in the mentoring relationship due to their knowledge. Mentors may desire to empower the protégé by sharing this knowledge with the protégé. Ironically, the power the mentor holds may stifle the professional development of the protégé. Erving (1995) experienced difficulties when she and her male mentor had competing definitions of success. He defined success in terms of moving up the organizational ladder. She, in turn, defined success in terms of balancing work and family life.

Lave and Wenger (1991) considered relationships where protégés served in positions of involuntary servitude. Historically, apprenticeship programs originally failed because of the coercive nature of the relationship. Snell (1996) noted that apprentices in the 1200's could not purchase land or marry. These coercive experiences dramatically hinder the learning process as well as limit the possibilities the protégé can participate fully in a particular profession (Lave & Wenger, 1991).

Darder (1996) described the link between power and truth. In particular, he noted the dominant group has the power to define truth within the function of society. Herring (2003) noted the power men held in the course of online dialogue. She described this situation as, "The contentiousness of many male messages tends to discourage women from responding, while women's concerns with considerateness and social harmony tend to be disparaged as a "waste of bandwidth" in male-authored netiquette guidelines" (p. 624).

Postman (1992) presented a case regarding the power the dominant group has to define the use of technology within society. He stated, "Those who have control over the workings of a particular technology accumulate power" (p. 9). We must also keep in mind when

underrepresented groups may lack access to technological resources to reap the benefits of online mentoring relationships (Guy, 2002).

Can CMC act in ways to empower both the mentor and protégé in meaningful ways? With respect to the four goals of mentoring, the ability of CMC to support underrepresented groups is a key concern for power. The degree to which CMC supports women and people of color in mentoring relationships is a crucial consideration. In addition, CMC should provide emotional support and professional development to underrepresented groups in online mentoring relationships.

Social Presence

Social presence denotes the sense of being together (de Greef & Ijsselsteijn, 2001) or a feeling of community among individuals in a learning environment (Conrad, 2002). De Greef and Ijsselsteijn (2001) considered face-to-face communication as the baseline for evaluating the sense of being together. In comparing audio to video communication, they found video communication had the highest degree of social presence. Mutual respect between participants is also an important consideration within social presence studies. For instance, Conrad (2002) found students in an online course under study "wanted to behave well online and they did not want to offend other group members" (p. 202).

Perhaps, the nature of social presence in online settings is evolving. Earlier findings regarding social presence by Sproull and Kiesler (1986) were much different from those of Conrad (2002). Respondents in Sproull and Kiesler's (1986) study reported flaming (speaking in a fanatical manner or being insulting) occurred on average 33 times per month via e-mail versus 4 times per month face-to-face. Have we learned the rules of proper online behavior since the 1980's? Are there other reasons to explain the differences between these two studies? Sproull

and Kiesler's (1986) findings were based on a business organization while Conrad's (2002) work involved an online class.

The manner in which we portray ourselves in online settings is an important element of social presence. Turkle (1995) stated that heavy Internet users "exist(s) in many worlds and play(s) many roles at the same time" (p. 14). I should note that the setting of her study did not involve formal online learning settings (e.g., an online class). Conrad (2002) noted this pattern of multiple roles played by online participants is less likely to occur in formal online learning settings. Online mentoring programs are intended to help the online protégé learn, but they are not formal online classes as considered in Conrad (2002). Because online mentoring programs do not directly fall in line with either Turkle's (1995) or Conrad's (2002) study setting, further research on the impact of multiple roles in online mentoring programs is recommended.

Social presence theory provides a lens for addressing the four goals of mentoring programs. Does the level of the social presence within CMC impact the online protégé's perceptions of the amount of emotional support he receives? Does social presence limit the capability of the online mentor to role model skills within the profession? Is the level of perceived emotional support within online mentoring relationships sufficient to address concerns with attrition or meeting the needs of underrepresented groups?

Computer-mediated communication for mentoring in today's world

The use of computer-mediated communication (CMC) in mentoring relationships is generally referred to as online mentoring or telementoring. O'Neill, Wagner and Gomez (1996) defined online mentoring as the "use of e-mail or computer conferencing systems to support a mentoring relationship when a face-to-face relationship would be impractical" (p. 39). Although the amount of face-to-face contact can vary, a totally online mentoring relationship would

involve no face-to-face contact. Ensher, Heun and Blanchard (2003) placed the degree in which CMC is used in online mentoring relationships along a continuum with four categories:

1) Totally face-to-face
2) CMC-supplemental: In this relationship, the bulk of the interaction is face-to-face with small amounts of online communication. An example of this would be where the mentor and protégé meet weekly face-to-face. They periodically communicate via e-mail to share electronic documents or schedule meeting times.
3) CMC-primary: In this relationship, the bulk of the interaction is online with small amounts of face-to-face communication. An example of this type of relationship is one where the mentor and protégé communicate on a weekly basis via e-mail. They may meet once a year at a conference.
4) Totally Online

Computer-mediated communication (CMC) impacts many facets of our daily lives including communicating with friends, family and colleagues, making online reservations and searching for information. Mentoring relationships are not excluded from the increasing application of CMC. Ensher, Blanchard and Heun (2003) estimated the number of online mentoring programs grew by 500% in a two-year timeframe.

Table 1.1 provides five examples of online mentoring programs. The purpose of these examples is to clarify what constitutes an online mentoring relationship. The five online programs described in Table 1.1 are only a very small sample of online mentoring programs that exist. My primary rationale for choosing these five examples is the manner in which they address the four goals of mentoring. The Electronic Emissary seeks to provide psychosocial support to K-12 students through self-reflection and dialogue with a subject matter expert. The

goal of Mentornet and Women in Coaching is to provide support to women in fields in which they are generally underrepresented (mathematics and science and coaching respectively). GANS provides real-life situations for the professional development of emergency medical professional. WINGS addresses three of the mentoring goals: providing emotional support to beginning teachers as a mechanism for addressing the high attrition rate and helping beginning teachers learn to teach effectively.

These examples demonstrate the treatment of similar goals in different professions (e.g., providing support to women in engineering and coaching through Mentornet and Women in Coaching respectively). Finally, these examples provide an illustration of the use of different forms of CMC in mentoring relationships. For example, with the exception of GANS, all of the examples use e-mail as the predominate form of communication. In contrast, GANS uses video teleconferencing as the means of communication.

Program	Website	Purpose	Literature References
Electronic Emissary	http://emissary.wm.edu	Subject matter expert provides real world information to K-12 students and teachers via e-mail	(Harris, 1994; Sanchez & Harris, 1996)
Mentornet	http://www.mentornet.net	Encourage women to enter careers in math, science and engineering through mentoring relationships with professionals in these fields via e-mail exchange for eight months	(Kasprisin, Boyle, Single, & Muller, 2003; Mueller, 2004)
Guardian Angel System (GANS)	http://inet2002.org/CD-ROM/lu65rw2n/papers/ipv64-bi.pdf	Expert medical personnel provide guidance to emergency personnel in the field via video teleconferencing	(Information Society Technologies, 2000)
Welcoming Interns and Novices with Guidance and Support Online (WINGS)	http://wings.utexas.org/	Experienced teachers at a distance provide support to beginning teachers in the state of Texas via e-mail	(Abbott, 2004)
Women in Coaching	http://www.coach.ca/WOMEN/e/mentor/index.htm	Women coaches provide support to other women coaches via e-mail	(Marshall, 2001)

Table 1.1. Examples of Online Mentoring Programs

Research Agenda for Online Mentoring

Despite the growth in applications of online mentoring programs, much of the evidence surrounding online mentoring programs is anecdotal (Bierema & Merriam, 2002). Ensher, Heun

and Blanchard (2003) developed several research propositions that are a useful starting point for researching online mentoring programs. Two of these research propositions are listed next.

The impact of previous mentoring and computer-mediated communication experiences

Ensher et al. (2003) hypothesized that previous online relationships and mentoring experiences will significantly predict the chances a person is willing to participate in an online mentoring program. One issue that must be resolved is how to measure previous online relationships and mentoring experiences. What questions reliably measure one's previous online relationships and mentoring experiences?

The impact of online mentoring on access to mentors

Ensher et al. (2003) believed that online mentoring will increase the number of contacts an individual has within a profession. Bierema and Hill (2005) stated that Internet technology erases barriers that exist in finding traditional face-to-face mentors. They believed that online mentoring has the capability to create mentoring relationships between individuals that do not know each other. In theory, online mentoring extends the boundaries of contacts outside one's own local area. In what ways does CMC impact access to mentors?

Other opportunities and challenges

Ensher et al. (2003) hypothesized that online mentoring offers several opportunities. Each of these is worth further research. First, they proposed that online mentoring would result in reduced costs relative to traditional face-to-face mentoring programs. If so, this may encourage more businesses to use online mentoring. Second, online mentoring may reduce the initial salience of demographics (gender, race and age). If so, this feature of online mentoring may provide greater access to the other members of a professional community for underrepresented groups (Bierema & Hill, 2005; Ensher et al., 2003).

In contrast, Ensher et al. (2003) described some challenges that online mentoring programs pose. First, they believed that online mentors will have greater difficulty in acting as a role model. Second, they proposed that online mentors will have greater difficulty in providing psychosocial support than face-to-face mentors do. Third, they believed that concerns regarding trust and security are more challenging in an online mentoring relationship.

Considering the Range of Computer-Mediated Communication

As shown in Table 1.1, e-mail is a common technology for online mentoring programs. The ubiquity of e-mail makes it an easy choice to use, but there are other computer-mediated choices (e.g., instant messaging, video teleconferencing, chat rooms) we should consider in online mentoring relationships. Cuban (2001) considered the lack of effective integration of technology into the curriculum of kindergarten through universities in Silicon Valley. Is technology integrated to the fullest extent possible in online mentoring programs?

Assessment regarding the manner in which mentors and protégés use various forms of computer-mediated communication (CMC) is needed. Gal-Ezer (2002) found that it was more difficult for students in introductory science classes to use the Internet to learn new material. In their study, advanced students were the most likely group to use the Internet. Mentors and protégés may have different levels of comfort from one another in using various forms of CMC (e-mail, instant messaging, chat rooms, discussion boards and video teleconferencing).

Additionally, online mentors and protégés may use CMC tools at different ways. Ferneding-Lenert and Harris (1994) noted the frustrations experienced by an online mentor when he received no responses from his class for over three weeks. He normally checked his e-mail

daily. In contrast, the teacher of the class only checked her e-mail bi-weekly. Contrasting patterns of CMC use between the online mentor and protégé can create feelings of being ignored.

Discussion

The title of the chapter posed the question whether the use of computer-mediated communication is a friend or foe to mentoring relationships. The answer to this question depends upon the context of the specific online mentoring program. During the course of this chapter, four important goals were described regarding mentoring programs. The degree to which specific online mentoring programs support (friend) or undermine (foe) the goals of mentoring is an important element in considering the title question of the chapter.

1) How does CMC allow the mentor to provide emotional support to the protégé?
2) What level of professional development can CMC provide to mentoring relationships?
3) What impact does online mentoring have on attrition rates within a profession?
4) What impact does online mentoring have on diversity in terms of gender, race and ethnicity within a profession?

Five examples of online mentoring programs were described within this chapter. The degree to which each of these programs meets the goal(s) of the program helps to answer the title question of the chapter. The purpose of the Electronic Emissary is to provide psychosocial support to K-12 students. Helping emergency medical personnel perform successfully in the field is the objective of GANS. The goal of Mentornet and Women and Coaching is to provide support to underrepresented groups within engineering and coaching respectively. WINGS addresses three goals for beginning teachers: providing emotional support, development of

teaching skills and decreasing the high attrition rate of beginning teachers. Do these online mentoring programs meet their respective goals?

Jacobi (1991) noted a theoretical framework is necessary to have some standard manner for evaluating whether mentoring programs have achieved desired goals . This chapter describes three theoretical frameworks for evaluating the ability of CMC to support or undermine the four goals of mentoring. First, does the online mentoring relationship provide benefits to both mentor and protégé (social exchange theory)? Second, online mentors and protégés should consider the balance of power within the relationship. Does the online mentoring experience exploit the wishes of either the mentor or protégé? Finally, perceptions of the salience of emotional and physical (e.g., body language) characteristics within CMC (social presence) is a useful framework for online mentoring research.

Because the overall mentoring goals defined earlier are so broad and diverse, no one mentor can realistically meet all of these goals in either a face-to-face or an online relationship. Burlew (1991) defined three types of mentors for business organizations: the training mentor, the educational mentor and development mentor. His model is based on different phases of an individual's career. The training mentor provides guidance to new employees. In contrast, the educational mentor helps more senior individuals in obtaining career-long education. His model provides a perspective on mentoring over time.

Peyton, Morton, Perkins and Dougherty (2001) defined five types of mentors for graduate students in gerontology: the information mentor, the peer mentor, the competitor mentor and the grandfather/grandmother mentor. Their model is based on different roles which mentors play. For instance, the information mentor provides information regarding the processes at a particular

work location. In contrast, the competition mentor works at another location from the protégé to provide information to the protégé regarding the industry as a whole.

Due to the diversity of mentoring goals and skills, research suggests the value of having multiple mentors. Johnson, Settimi and Rogers (2001) noted the value of multiple mentors in the medical field due to the wide range of paths a medical student could take. Zachary (2000) noted multiple mentors may minimize the chances of a single mentor becoming overwhelmed. In addition, she found that three quarters of Generation X'ers liked the idea of having multiple mentors. Although these studies focused on traditional face-to-face mentoring, the value of multiple online mentors is a useful consideration as well.

Research should assess the value of all forms of CMC to meet the goals of mentoring relationships. Bierema and Hill (2005) stated that each form of CMC carries a set of affordances to mentoring relationships. E-mail provides the flexibility of both time and place independence to the mentor and protégé. In contrast, chat rooms only provide place independence to the mentor and protégé. A comparison of various forms of CMC puts many of the four goals of mentoring in tension. Ensher et al. (2003) proposed that e-mail may reduce the initial salience of demographics (race, gender and age) of the mentor and protégé. This is important because mentoring relationships are often established on perceived similar characteristics (Ensher & Murphy, 1997). E-mail, in this light, could potentially provide a wider range of mentoring opportunities to women and people of color. The online mentor and protégé could use e-mail to focus on similar interests rather than similar demographics.

However, e-mail presents challenges to online mentoring relationships. The lack of visual cues decreases the opportunities for the mentor to role model. In combating this, video teleconferencing (e.g., WebCAM) may provide a greater level of social presence than e-mail (de

Greef & Ijsselsteijn, 2001). Because video teleconferencing provides visual information, the mentor may have a greater opportunity to role model and coach. Conversely, video teleconferencing will increase the salience of demographics. Would this increased salience diminish the ability of women and people to find online mentors?

This chapter presented three theoretical frameworks in order to establish a set of questions for consideration in the design, development and evaluation of online mentoring programs. From social exchange theory, we should begin to question the benefits online mentors and protégés seek from these relationships? How is power used in online mentoring relationships? Using social presence, how do different forms of CMC influence the manner in which the online mentor or protégé interact or treat with one another?

Looking ahead: Chapter two

This chapter introduced the concept of online mentoring by providing five examples of online mentoring programs. This chapter also provided an overview of some theoretical frameworks for researching online mentoring. Chapter two will describe three theoretical constructs (social exchange, power and social presence) in further detail through a review of the literature. I will analyze the strengths and weaknesses of each theoretical framework relative to addressing the issues facing online mentoring.

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CHAPTER 2

LITERATURE REVIEW

Introduction

Jacobi (1991) noted two issues that existed with respect to mentoring research. First, colleges and universities were increasingly using mentoring programs in both graduate and undergraduate education. Second, despite the widespread use of mentoring, no common definition existed for mentoring. The ambiguity surrounding the views of mentoring created a world of research where "descriptions of mentoring programs are so diverse that one wonders if they have anything at all in common beyond a sincere desire to help students succeed" (Jacobi, 1991, p. 505). The ambiguity did not attenuate the volume of mentoring research conducted, but the lack of coherence made it very difficult to compare the results of these studies. For this reason, she made a case for the need of providing an operational definition of mentoring as well as a set of theoretical perspectives for researching mentoring.

Since the time of Jacobi's (1991) article, the advent of Internet technology offers some new possibilities to traditional face-to-face mentoring relationships. With computer-mediated communication (CMC) like e-mail, instant messaging and video teleconferencing, mentors and protégés can communicate with one another from a distance. E-mail allows mentors and protégés to communicate with one another at different times according to personal convenience (Duff, 2000). CMC-based mentoring relationships, in theory, no longer bound mentors and protégés by physical proximity or time.

CMC-based mentoring relationships are generally referred to as online mentoring, e-mentoring or telementoring. The potential of online mentoring to allow mentoring relationships to occur at a distance may in part explain the rapid growth of online mentoring programs. Ensher et al. (2003) made a case that the number of online mentoring programs grew significantly in the first two years of this century. Unfortunately, research has not kept pace with

the growth in the number of online mentoring programs in existence (Bierema & Merriam, 2002; Ensher et al., 2003; Guy, 2002). Much of the "evidence" regarding online mentoring is anecdotal. The present state of affairs suggests that "while online mentoring is thriving, little is known about the success and unique challenges of this phenomenon" (Ensher et al., 2003, p. 265).

The present challenges regarding online mentoring research are similar in some ways to the challenges described by Jacobi (1991) regarding traditional face-to-face mentoring relationships. First, she noted the difficulty posed by the wide range of views regarding what constitutes a mentoring relationship. The literature (e.g., Bierema & Merriam, 2002; Ensher et al., 2003; Guy, 2002) contains some variations on the definition of online mentoring. In light of that, an operational definition of online mentoring is needed in order to define the boundaries of online mentoring research. What constitutes an online mentoring relationship? Second, Jacobi (1991) noted the need to provide a theoretical link between mentoring and desired outcomes. Theoretical frameworks are needed for online mentoring research as well to provide a structured approach to defining successes and challenges of online mentoring.

The purpose of this chapter is to describe three theoretical frameworks (social exchange, power and social presence) and their applicability to researching online mentoring. I consider the applicability of each theoretical framework by describing the original intentions of the theory and the strengths and limitations for online mentoring research. The literature for some of the frameworks is collected from areas other than online relationships. For instance, much of the work regarding power is contained in the cultural research literature. I first describe my methodology for conducting my literature review. The next section of this chapter contains the definition I use for online mentoring. I then deal with each of the theoretical frameworks and

their applicability to online mentoring research. Because a wide range of professions have used online mentoring (Ensher et al., 2003), I focus on the role of online mentoring in one particular profession namely the role of telecommunications in teacher induction. The chapter concludes with a set of questions that further research should address with respect to online mentoring programs.

Literature review methodology

I conducted my literature search in social and educational databases including Academic Search Premier, Business Search Premier, Dissertation Abstracts, Google Scholar (http://scholar.google.com), NetLibrary (http://www.netlibrary.com) and ProQuest. I restricted my initial search to books, dissertations and peer-reviewed journal articles. Five areas (online mentoring, teacher induction using telecommunication, social exchange theory, power and social presence) were the focus of the literature review. Search terms used in exploring these six areas are explained next.

- Online mentoring: Initial searches were made using the phrase “online mentoring”. Later searches used synonyms for online mentoring including “telementoring” and “e-mentoring”.
- Teacher Induction: I used “teacher induction”, “induction” and “teacher education” to explore the various facets of methods of introducing new teachers to the profession. These three terms regarding induction were used in conjunction with various forms of communication technology including “telecommunication”, “computer mediated communication”, “Internet” and “technology”.

- Social Exchange: Initial searches were made using the key term “social exchange” only. Later searches were made using social exchange in conjunction with mentoring (“social exchange” and “mentor”) and Internet-based relationships (“social exchange” and “online”).
- Power: In order to prevent any confusion with power in the sense of electrical power, I used the term “power relations” in lieu of “power”. I searched for articles regarding power from cultural research (“power relations” and “culture”), power in mentoring relationships (“power relations” and “mentor”), power in online relationships (“power relations” and “online”) and power in online mentoring relationships (“power relations” and “mentor” and “online”).
- Social Presence: I first searched on “social presence” in order to gain a perspective of the specific features associated with this theory. One component of social presence theory was the notion of flaming (i.e., insulting remarks). I began to search for articles that addressed issues of flaming. The final aspect of my search regarded social presence relative to particular forms of technology (e.g., social presence and video teleconferencing).

I additionally used the reference list from articles found in my library search for further reading.

The five areas discussed in the literature review represent three dimensions. Teacher induction represents the dimension of time. Paese (1990) defined an induction teacher as “a teacher who is in the first three years of teaching” (p. 159). He further stated that the purpose of teacher induction programs is to develop teaching skills in order to increase the effectiveness of beginning teachers. Mentoring (face-to-face or online) represents one method of professional development. Providing teaching workshops is another method of professional development for

the induction teacher. Although the focus of the literature on mentoring involves teacher induction (Abbott, 2004; Athanases & Achinstein, 2003; Haack & Smith, 2000; Rippon & Martin, 2003), this does not preclude the use of mentoring for the professional development of experienced teachers as well (e.g., Fay & Hill, 2003). Table 2.1 provides a tabular prospective of the relationship between the five areas (online mentoring, induction, social exchange, power and social presence) along three dimensions (method of professional development, time and theoretical framework). The intent of providing a literature review along five areas and three dimensions is to provide a set of three theoretical frameworks for assessing online mentoring at any point in a teacher's career.

	Time		**Theoretical Perspective**		
Professional Development Method	Protégé Teaching Less than 3 Years?	Protégé Teaching Longer than 3 years?	Social Exchange	Power	Social Presence
Online Mentoring	Online Mentoring for Induction	Non-Induction Online Mentoring	Benefits extend to both mentor and protege	Ramifications of power dynamics between mentor and protege	Saliency of characteristics of mentor and protégé through CMC interaction

Table 2.1. Relationship between the five areas of the literature review

Defining online mentoring

One of the chief challenges regarding mentoring research was providing an operational definition of mentoring (Jacobi, 1991). If challenges in defining face-to-face mentoring exist, defining online mentoring is at least equally as challenging. My intention with this section is to develop a definition of online mentoring from the literature. This definition assimilates the functions of mentoring with online relationships.

O'Neill, Wagner and Gomez (1996) defined online mentoring as "use of e-mail or computer conferencing systems to support a mentoring relationship when a face-to-face relationship would be impractical" (p. 39). This definition captures the role of CMC in online mentoring, but what is involved in a mentoring relationship? The literature will provide a basis for understanding the important elements of a mentoring relationship.

Jacobi (1991) cited fifteen different definitions of mentoring in the fields of higher education, management and psychology. Although there are variations in these definitions, three common elements exist. First, several of the definitions speak of sponsorship, career development and career progress denoting ideas that the mentor should help with the professional development of the protégé. Second, professional development included the need for the protégé to develop skills necessary to function within the profession. Third, a number of the definitions speak to the emotional and psychosocial support the mentor should provide like counseling. In looking at Jacobi's (1991) overview of the literature, three important elements of mentoring relationships include: professional development, development of the protégé's skills in the profession and providing emotional or psychosocial support to the protégé.

Further investigation into the literature reveals two other important functions of mentoring relationships. Certain demographic groups, particularly women and people of color, face challenges when entering professions that are underrepresented by their demographic group. Mentors have provided help to protégés in entering these professions. As an African American female professor at a predominately Caucasian university, Juanita Johnson-Bailey described the lack of support she received when dealing with research interests involving race (Johnson-Bailey & Cervero, 2004). While others laughed at her dream to become a professor, Ron Cervero, her mentor, helped her claim her dream. Women are also an underrepresented group in other careers

as well like mathematics and science careers. Holland and Eisenhart (1990) found mentors were key factors to women involved in mathematics and science careers. For this reason, I propose that mentors are important in supporting underrepresented groups in particular professions.

High attrition rates also plague a number of professions and groups. Herzig (2002) estimated the proportion of mathematics students that do not complete their doctorate ranges from 30 to 70%. High attrition rates were compounded by the fact that 20% of all doctoral students that do not complete their degrees are in the dissertation phase of their studies. By modeling the key characteristics of being a researcher, Herzig (2002) described the value mentors can provide in helping address issues of high attrition by modeling the key characteristics of a successful researcher. The research literature (Billingsley, 2004; Dove, 2004; McGlamery & Edick, 2004; Millinger, 2004) also described the role mentors can play in reducing the high attrition rates of new teachers.

Based on these ideas from the research literature, I will use the following definition for online mentoring during the course of this dissertation.

Online mentoring is a reciprocal relationship between two people (the mentor and protégé) that is conducted through some form of CMC (e-mail, instant messaging, video teleconferencing, etc.) for professional development. The purpose of this relationship is to accomplish at least one of the following goals:

1) Provide emotional or psychosocial support
2) Developing skills within a given profession
3) Promoting diversity and encouraging underrepresented groups in a given profession
4) Addressing problems of high attrition within a given profession

This definition does not exclude online mentoring that may occur within formal class settings (e.g., online peer mentoring between two individuals taking the same online class). This definition does not preclude online mentoring that takes place in non-class settings either (e.g., online mentoring between an in and pre-service teacher that is not part of a formal curriculum).

Three theoretical frameworks for online mentoring

Table 2.2 displays a graphic organizer of the literature I reviewed with respect to three theoretical frameworks: social exchange theory, power and social presence. The key concern describes the general area that the theory treats in the realm of online mentoring. For instance, social exchange theory provides a lens for reviewing the degree of reciprocity of benefits that exist between online mentors and protégés. The table displays a synopsis of my analysis of the strengths and limitations of each theory in treating online mentoring research. I based my analysis on the literature that is listed in the graphic organizer within each theory. I use the limitations of each theory in treating online mentoring research to describe key questions for future research in the discussion section of this chapter.

	Social Exchange	Power	Social Presence
Key concern	Reciprocity of benefits to mentors and proteges	Implications of the control held by the mentor	Perceived salience of individuals communicating with CMC
Literature described in this review	Duff, 2000; Ensher et al, 2003; Jacobi, 1991; Lynch, 2003; Sanchez & Harris, 1996; Schrum, Skeele, & Grant, 2002-2003; Singer, 2005; Vo-Thanh-Xuan & Rice, 2000; Wilson & Elman, 1990	Abbott, 2004; Darder, 1996; Ensher et al., 2003; Ensher & Murphy, 1997; Ervin, 1995; Hansman, 2002, Herring, 2003; Holland & Eisenhart, 1990; Houston, 1997; Johnson-Bailey & Cervero, 2004; Peterson, 1999	Conrad, 2002; de Greef & Ijsselsteijn, 2001; Ensher et al., 2003; Gackenbach, 1998; Harms, 2005; Mueller, 2004; Short, Williams & Christie, 1976; Singer, 2005; Sproull & Kiesler, 1986; Tu & McIssac, 2002; Turkle, 1995
Strengths of the literature described in the review in addressing issues of online mentoring	Describes importance of reciprocity of benefits (e.g., reciprocal learning)	Provides information regarding topics of dialogue for the online mentor and protégé regarding culture	Provides quantitative measures for perceptions of CMC-based relationships
Limitations of the literature described in the review in addressing issues of online mentoring	Further research needed on benefits to sponsoring organizations	Further work needed regarding power as applied to online mentoring	Further work needed comparing various forms of CMC
	No longitudinal results to address long-term benefits of online mentoring relationships		Did not address social presence in cross-gender settings

Table 2.2. Graphic Organizer of Three Theoretical Frameworks

Social exchange theory

At first glance, the benefits of mentoring may seem one-sided in that the protégé is the only one to reap benefits from the mentoring relationship. Social exchange theory contradicts this one-sided view. Social exchange theory claims that the benefits of mentoring are reciprocal to the mentor as well (Ensher et al., 2003; Jacobi, 1991). Jacobi (1991) noted an important

element of mentoring programs is “the mentor as well as the protégé derives benefits from the relationship, and these benefits may be either emotional or tangible” (p. 513). Vo-Thanh-Xuan and Rice (2000) observed social exchange theory at work with grandparents mentoring their grandchildren. They stated that “Grandparents tend to have an inferiority complex due to the perception that their knowledge and wisdom is regarded as old-fashioned” (Vo-Thanh-Xuan & Rice, 2000, p. 272). Through the process of mentoring their grandchildren, the grandparent’s psychological and physical health as well as their overall happiness was promoted.

The idea of social exchange is that the benefits between mentors and protégés are reciprocal, but what does the literature say about social exchange in mentoring relationships among teachers? Schrum, Skeele, and Grant (2002-2003) noted the reciprocity present between pre- and in-service teachers. In their study, the pre-service teachers acted as mentors in helping in-service teachers learn how to integrate technology into the classroom. At the same time, the pre-service teachers learned about practical implications of using technology in the classroom. Cooperating teachers shared their experience with pre-service teachers, and pre-service teachers taught in-service teachers about technology. Lynch (2003) referred to the mutual learning in mentoring relationships between teachers as reciprocal learning relationships. She observed that reciprocal learning took place as the mentors and protégés were exposed to new ideas.

Lynch’s (2003) study is the only social exchange literature involving online mentoring relationships I’ve discussed to this point. Are there other areas that address social exchange in online mentoring relationships? Sanchez and Harris (1996) noted the incidence of social exchange in the Electronic Emissary (an online mentoring program that connects K-12 teachers and students to subject matter experts via e-mail). Janna was a ten-year old girl from Connecticut that wanted to learn more about King Arthur literature. This was not a topic

covered in her local school's curriculum, but the Electronic Emissary filled this void by finding an online mentor for her. Her online mentor was a 74-year old English Professor Emeritus from the University of Arizona (Dr. Eisner). Janna had the opportunity to learn about a topic of interest to her, but Dr. Eisner learned from the experience as well. Dr. Eisner stated, "The second benefit is that I went back to my Arthurian students, which I had ignored for many years, and, thanks to Janna's questions, found myself deep in the Arthurian lore while learning all over again what a fascinating area of study that is" (Sanchez & Harris, 1996, p. 58).

One challenge to face-to-face mentoring relationships is the need for the mentor and protégé to coordinate their time schedules. This is often a difficult task in today's busy world (Duff, 2000; Ensher et al., 2003; Lynch, 2003; Singer, 2005). One benefit of asynchronous online mentoring relationships (e.g., e-mail) is the ability for both the mentor and protégé to communicate at their convenience (Duff, 2000; Singer, 2005). A participant in Duff's (2000) study stated, "E-mail is fast and convenient for both the student and the professional which makes it easier to communicate on a regular basis. Flexibility is also important to the busy professional" (pp. 51-52). Asynchronous online mentoring may benefit both the online mentor and protégé in terms of providing convenience.

The focus on social exchange so far has been on reciprocity of benefits to both the mentor and protégé, but other entities are equally as important. Despite the emphasis of the importance of teacher mentoring programs by state governments, these programs were often eliminated due to lack of funding (Abbott, 2004). In order to make a case for mentoring programs to funding agencies, social exchange must also consider the reciprocity of benefits to organizations that support mentoring programs. Wilson and Elman (1990) described the benefits that come to business organizations that sponsor mentoring programs. They found that benefits that business

organizations derive from formal mentoring programs include finding talent that exists in the organization and teaching the corporate culture to new employees. Because their study involved corporate culture, their results may not directly apply to school settings. As a motivation to encourage further research regarding social exchange to sponsoring organizations, Ensher et al. (2003) proposed that organizations that support online mentoring programs may see a reduction in cost in terms of both time and money. During the course of my literature review, none of the articles I found discussed social exchange relative to state and local governments or principals in supporting either face-to-face or online mentoring programs for teachers. For that reason, I believe further research is necessary regarding benefits that accrue to organizations that support online mentoring programs for teachers.

Another limitation with the literature described for social exchange research on online mentoring is the lack of longitudinal research. Johnson-Bailey and Cervero (2004) described the changing nature of their face-to-face mentoring relationships over the course of several years. Reciprocal learning was one of the elements described in the literature around social exchange. Barnett (2002) made a case for longitudinal studies that would help to differentiate between actual versus perceived learning. In other words, does the reciprocal learning that takes place in online mentoring have long-lasting effects? Longitudinal research would help to address a number of questions regarding social exchange in online mentoring. Can online mentoring relationships last for long periods of time? Do the benefits in online mentoring relationships change over the course of time? How do benefits from online mentoring relationships impact one's professional practice?

Power

Because the mentor is considered to have superior knowledge relative to the protégé (Hansman, 2002), the mentor has more power than the protégé in determining the dynamics of the mentoring relationship. For instance, the mentor has the power to assess the protégé's understanding of the knowledge within a profession. Because the mentor may occupy a higher position in the organizational structure than the protégé, the mentor has some degree of power over the promotion process of the protégé. Although the mentor may seek to enhance the career development of the protégé, Hansman (2002) noted the paradox that the mentor may actually use power to stifle the professional development of the protégé. Power theory seeks to explore the ramifications to the mentoring relationships from the power the mentor possesses.

Snell (1996) researched the history of the British apprenticeship system. In his investigation, he noted the apprenticeship system historically served as a subtle form of oppression of the poor. In these relationships, apprentices had forced lengths of service where they could not purchase land or marry. Dawson (1999) described the apprenticeship system as one in which "masters wanted to make money out of the young charges, and the lads resented the coercion" (p. 152). Although issues of power relations in today's world may not be as overt, mentors should consider how their own cultural history may impact the protégé's trust (Johnson-Bailey & Cervero, 2004).

Hansman (2002) noted issues of power are particularly relevant when

> Persons who serve as mentors may primarily be members of dominant or hegemonic groups within organizations or institutions. Potential protégés, particularly those considered "other" by virtue of the intersection of gender, race, class, ethnicity, ability, or sexual orientation, may experience difficulties initiating and participating in informal mentoring relationships. (p. 39)

Issues of power involve the potential for the mentor to address the needs of the organization or dominant group at the expense of the protégé's learning experience. Power impacts the ability of the protégé to obtain mentors. In addition, power can impact the course the mentoring relationship takes once this relationship is initiated.

Mentors and protégés can have different views of the meaning of success that may account for the way power is used in the mentoring relationship (Ervin, 1995; Hansman, 2002). Ervin (1995) considered the glowing praise a former male professor mentor gave to a male doctoral English student (John). The male mentor noted that John literally crawled over his lap at a restaurant to meet an important scholar in his field. The male mentor described John's aggressiveness as a source of John's success in obtaining forty interviews and twenty invitations for site visits. In contrast, Ervin and many of her colleagues measured success in terms of balancing their own career needs with the needs that existed in their family. Hansman (2002) noted, "These women were considered unsuccessful by the standards of success set by Ervin's male mentor; therefore, they received little, if any, mentoring help" (pp. 44-45).

Because power often acts in subtle ways, a reflective observation by mentors and protégés regarding the implications of power in the mentoring relationship is useful. Power is strongly linked to historical events that influence our perceptions of the existing mentoring relationship. Johnson-Bailey and Cervero (2004) reflected on the challenges they faced in their own cross-gender, cross-racial mentoring relationship. They noted that trust is the key to any mentoring relationship. In theory, building trust between two individuals seems relatively straightforward. Building trust seems to be a personal matter between the mentor and protégé. In cross-cultural mentoring relationships, there are histories between the cultures that create implications for trust that go beyond the mentor and protégé. Johnson-Bailey and Cervero

(2004) stated, “The historical legacy of relationships between black and white Americans is a two-sided issue of mistrust” (p. 11). In their case, a mentoring relationship between a white male and an African American female is not always viewed favorably by society at large. They found that discourse and acknowledgement of this historical legacy was key to building trust with one another.

If discourse between the mentor and protégé is a key element in establishing trust in multicultural mentoring relationships, how should online mentors and protégés approach this discourse? Based on the literature discussed so far, the discourse should involve two things:

1) The mentor and protégé should discuss their views regarding the meaning of success.
2) The mentor and protégé should discuss their own historical cultural legacies. In addition, this discourse should focus on implications these legacies pose to the mentoring relationship. For example, how do these legacies impact our building of trust? Grant and Sachs (1995) recommended

> A discourse that illuminates a greater understanding of the self and the multiple ascribed characters (ethnicity, gender, socioeconomic status) that are used to define oneself, both by others and by oneself, understanding how institutions work, their histories of exploitation and repression. (p. 94)

However, challenges exist in creating meaningful discourse between two or more cultural groups in terms of race (Houston, 1997), socioeconomic status (Peterson, 1999) and gender (Herring, 2003). Houston (1997) described the difficulties black women have in communicating with white women. The black women were interested in expressing their feelings; whereas, the white women’s focus was on correct grammar. Peterson (1999) observed the challenges that existed around dialogue between members of two different socioeconomic classes. She became quite aware of the challenges socioeconomic class imposes on dialogue

while teaching an adult education class. One resistant young woman in an abusive relationship with no money responded, “How can you tell me anything? You with your good education and nice job; you’ve never had to struggle in your life.” (p. 89).

The negative connotation of the word power creates difficulties in conducting discourses on power. Power is often seen as judicial or punitive rather than a neutral one that can act in both positive and negative ways (Darder, 1996). The dual nature of power is described in Johnson-Bailey and Cervero (2004). They considered the negative historical context of power between the races, but they also considered the positive ways in which power could impact their relationship as well. As a respected professor within the academy, Cervero held the cultural power of their relationship. He used his power to support Johnson-Bailey’s research and provide a further measure of credibility to her work to the academy.

The terms cultural reproduction and cultural production provide a means of comparing the positive and negative ways in which the mentor can use power. Cultural reproduction means that individuals follow the patterns set by previous generations (Holland & Eisenhart, 1990). Cultural reproduction serves to pass the cultural norms, patterns and actions to the next generation. In contrast, cultural production describes the idea that “people forge their own meaning systems in response to the societal position they face and its material implications” (Holland & Eisenhart, 1990, p. 33). The mentor can use power in a negative way through cultural reproduction to reinforce the patterns set by the dominant culture. The mentor can also use power in a positive way through social production to understand the implications of their positions in society, but they also look for ways to develop new methods for defining the protégé’s place in society.

Although these challenges on multicultural dialogue took place in face-to-face settings, challenges do exist in online multicultural dialogue as well. Research has found women to be reticent over the Internet because they are not taken as seriously as their male counterparts. For example, Herring (2003) found "the contentiousness of many male messages tends to discourage women from responding, while women's concerns with considerateness and social harmony tend to be disparaged as a "waste of bandwidth" in male-authored netiquette guidelines" (p. 624). Based on her analysis, males have the power to describe appropriate discourse over the Internet.

Research (Bierema & Hill, 2005; Ensher & Murphy, 1997; Hansman, 2002) points to the difficulty women and people of color have in finding face-to-face mentors. Those in positions to serve as mentors are often white men (Ensher et al., 2003; Hansman, 2002). Mentoring relationships are generally started on the basis of similar demographic characteristics (gender, race) shared between the mentor and protégé (Ensher & Murphy, 1997). Ironically, mentoring relationships that last are generally based on shared common interests, rather than similar demographics, between the mentor and protégé.

Recent research interest on the possibilities of online mentoring to provide greater access to mentors for women and people of color is starting to emerge (Ensher et al., 2003). Their belief is that CMC will minimize the impact of demographic differences while maximizing the chances of focusing on similar interests. The focus on online mentoring's ability to provide greater access to mentors is not exclusively related to women and people of color. In a study conducted by Abbott (2004), she found many teachers were reluctant to speak with local face-to-face mentors for fear of the power held by the local administration (e.g., fear that their evaluations would be adversely impacted). In contrast, these teachers felt much more comfortable talking with their online mentors who had no power over their evaluation.

Based on my literature review, research regarding power in online mentoring relationships is sparse (i.e., database searches on power relations and mentor and online yielded no results). However, I found some literature regarding power in online relationships in general (Herring, 2003). The focus of the literature I found regarding power in online relationships generally related to the nature of power to large groups rather than two individuals (mentor and protégé). Herring (2003) discussed the nature of power in online discourse of men versus women. Wilson and Peterson (2002) focused on power in online communities rather than power within mentoring relationships between two individuals.

The literature discussed within this review on power provides some important information for online mentoring research. In particular, cross-cultural mentoring relationships should incorporate dialogue on issues of power especially those related to cultural histories. Because trust is an essential element in mentoring relationships (Johnson-Bailey & Cervero, 2004), online mentoring research should focus on the relationship between power and building trust. Some researchers hold that the building of trust in online mentoring relationships is of greater concern than face-to-face mentoring relationships (Ensher et al., 2003). Online mentors and protégés may have less trust in discussing cultural issues in documented forms like e-mail. For this reason, further research on the issue of power in online mentoring relationships between two individuals is recommended.

Social presence

Social presence measures the manner in which individuals using CMC perceive physical characteristics and actions of others. Some connotations of the social presence include the sense of being together (de Greef & Ijsselsteijn, 2001) or a feeling of community of individuals in an online learning environment (Conrad, 2002; Tu & McIsaac, 2002). Short, Williams and Christie

(1976) conducted some of the original work on social presence. They defined social presence as "The degree of salience of the other person in the interaction and the consequence salience of interpersonal relationships" (p. 65).

Face-to-face communication is considered the baseline or "gold standard" (Harms, 2005, p. 8) for measuring social presence. The high degree of social presence associated with face-to-face communication lies in the media richness of face-to-face interaction. Media richness describes the degree to which a medium can convey intended meanings of communication. In face-to-face communication, senders and recipients have not only the words but facial and body language to assist in understanding the meaning of the message.

de Greef and Ijsselsteijn (2001) compared social presence between audio only to audio/video. They conducted a designed experiment using the Photoshare system, a system that allows participants to show family pictures to one another. They developed and used a questionnaire that included several bipolar measures (cold versus warm, impersonal versus personal) in assessing social presence. They controlled for gender, and women had a higher level of social presence than did the men. Additionally, the use of video/audio had a higher level of social presence than using audio only.

Two limitations existed in terms of applying de Greef's and Ijsselsteijn's (2001) results to online mentoring research. First, all pairs of participants were friends with one another. Participants in online mentoring programs may not know each other at the beginning of their relationship. Second, these results were collected at a single point in time. Online mentoring relationships may take place over moderately long periods of time. The nature of these online mentoring relationships may change over time. For instance, Ensher et al. (2003) stated that

online mentors and protégés often wish to eventually meet face-to-face. What would be the impact on social presence after meeting face-to-face?

Several facets compose the nature of social presence. Harms (2005) considered six different dimensions of social presence. These dimensions were

- Co-presence: Co-presence provides a measure of the level to which individuals do not feel alone or separated from the other person.
- Attentional allocation: Attentional allocation refers to the level of attention an individual provides to another person and receives from the other person.
- Perceived message understanding: Perceived message understanding measures your capability of understanding the message sent from another person. Perceived message understanding also includes your perception of how well the other person understood your message.
- Perceived affective understanding: Perceived affective understanding measures your capability in understanding another person's emotional and attitudinal states as well as your perception of their ability to understand your emotions and attitudes.
- Perceived affective interdependence: Perceived affective interdependence is the degree to which one's emotions and attitudes impact the attitudes and emotions of another.
- Perceived behavioral interdependence: Perceived behavioral interdependence measures the impact of one's behavior on another person's behavior.

His hypothesis was that face-to-face interaction would have significantly higher levels along all six dimensions of social presence in comparison to audio and video interaction, audio only interaction and text only interaction. He controlled for whether the participants were good friends or not.

In his study, Harms (2005) conducted a designed experiment with 131 pairs of individuals. The pairs completed a task together involving developing a plan of survival after a plane crash. After completing the task, the participants completed a 36-item questionnaire to measure social presence along all six dimensions. Only two dimensions (perceived message understanding and perceived affective understanding) resulted in face-to-face communication having significantly higher levels of social presence. The experimental environment of this study may in part explain the difficulty in making other findings regarding social presence. Participants took part in the study in a computer lab. Prior to starting the study, participants sat in a waiting room where they could see the experiment in action. The experimental conditions of this study were much different than might exist within natural settings of interaction (e.g., WINGS). For example, the paired individuals only interacted once with each other for one hour. Additionally, the paired participants focused on a very specific task in contrast to possibly unstructured tasks that online mentoring relationships might consider (e.g., learning to teach around standards-based reform).

One implication of social presence theory to online relationships is the possibility for flaming (speaking in a fanatical manner about uninteresting topics or being highly insulting to others). Some of the present research regarding the increased possibilities of flaming in online mentoring relationships is based on the work of Sproull and Kiesler (1986). In their study, they explored the use of e-mail in business settings. They found that the incidence of flaming increased significantly in the use of e-mail. The respondents in their study stated flaming occurred on average thirty-three times per week while using e-mail. In contrast, flaming occurred on average four times per week in face-to-face communication.

Based on the findings of Sproull and Kiesler (1986), some of the researchers (e.g., Ensher et al., 2003; Mueller, 2004) have hypothesized the probability of flaming is greater in online mentoring relationships. Because Sproull and Kiesler's (1986) work was not set in the context of mentoring relationships, further work is needed to substantiate the degree of flaming that may occur in online mentoring relationships. Gackenbach (1998) found the anonymity present on the Internet can cause mentoring relationships to turn hostile even for mentors and protégés that know each other very well. However, one issue that research needs to address is the incidence of flaming that might occur in forms of CMC that possess less anonymity (e.g., video teleconferencing). Although de Greef and Ijsselsteijn (2001) found video teleconferencing possessed higher levels of social presence over audio only, there was no link made between social presence and flaming.

The particular setting in which CMC is used may impact social presence as well. While researching the nature of interaction between heavy Internet users, Turkle (1995) stated these heavy Internet users "exist(s) in many worlds and play(s) many roles at the same time" (p. 14). While exploring online behavior in an online class, Conrad (2002) stated that Turkle's (1995) work did not directly apply to formal class settings. In her study, she found the online students developed an online etiquette with one another in attempt to behave favorably toward one another. In comparing these two settings, a dilemma is posed regarding online mentoring research. The setting of online mentoring is typically somewhere between that used by Turkle (1995) and Conrad (2002). As in a formal class setting like Conrad (2002), the purpose of online mentoring is to learn. At the same time, these relationships may take place in a less structured environment similar to Turkle (1995).

In some cases, interesting results emerge regarding social presence when the researcher did not plan *a priori* to specifically explore social presence. Singer's (2005) research intent was to explore a method of documenting student teaching experiences through the use of a listserv. During the course of the study, one participant asked for advice and emotional support after she had to end a fight between two students. She was unsure whether her actions were appropriate or not. Although the initial replies did focus on her need for emotional support and advice, two of the student teachers became involved in a very heated online discussion regarding whether men or women were more violent. They began to throw verbal barbs at one another regarding each other's lack of intelligence. Attempts by the facilitator to resolve this issue only escalated the matter as the two students felt they should resolve the issue on their own.

Social presence research involving exploration of real-world environments (e.g., student teachers learning through a listserv) may provide a set of richer results than what might be achieved through planned designed experiments. In the case of Singer's (2005) work, several research questions regarding social presence and flaming emerge. Resolution of the "flame war" even by other students was very difficult. Did early warning signs exist that a "flame war" was about to erupt? Information of this sort may help online mentors and protégés think metacognitively about flaming. This may help online mentors and protégés recognize early warning signs of flaming and taking appropriate steps to prevent flaming from happening. Another student teacher felt she was insulted by a professor over the listserv and subsequently stopped participating on the listserv. Because trust is an essential ingredient to mentoring relationships (Johnson-Bailey & Cervero, 2004), how does flaming impact trust in online mentoring relationships?

One difficulty regarding flaming is the subjectivity in defining flaming. The meaning of flaming is defined in part by the context and the individuals involved. Harms (2005) noted some of the male pairs that were friends would extend their middle index finger to one another over the video. Although this is typically used as a derogatory gesture, the participants in the study actually used it as form of bonding with one another. In dealing with flaming, Singer (2005) recommended that you should consider if you would say the same thing in a face-to-face setting.

Discussions regarding flaming may create the impression that lack of social presence is always problematic for online mentoring relationships, but lack of social presence may impact online mentoring in positive ways. As noted in the power subsection of this review, women and people of color often find it difficult to find face-to-face mentors. Individuals in positions to mentor may not possess similar demographic characteristics. Similar demographic characteristics like gender, race or ethnicity are often the basis for initial establishment of the mentoring relationship (Ensher & Murphy, 1997). Because CMC possesses less social presence or salience than face-to-face relationships, Ensher et al. (2003) believed that "online mentoring may be particularly advantageous for women, people of color, and people with disabilities who may find it more challenging to attract mentors in some professions and organizational levels" (p. 282).

Social presence theory seeks to measure the impact of CMC on online mentoring relationships. Social presence theory can help online mentoring research to understand issues on several dimensions described in Harms (2005). Each of these areas of social presence has important implications to online mentoring relationships.

- How isolated do the online mentor or protégé feel from one another (co-presence)?

- How attentive are online mentors and protégés to each other's e-mail (attentional allocation)?
- How well do online mentors and protégés understand what is being said in one another's e-mail messages (perceived message understanding)?
- How well can online mentors and protégés differentiate between emotions like happiness or sadness in the other party (perceived affective understanding)?
- What impact would emoticons (smiley face or lol – laughing out loud) used by online mentors or protégés have on the other party's emotional state (perceived affective interdependence)?
- Would flaming by one party in the online mentoring relationship increase the likelihood the other party would flame as well (perceived behavioral interdependence)?

The literature described in this subsection of the review has certain limitations to addressing issues facing online mentoring. First, data were often collected at a single point in time. In contrast, online mentoring relationship often last for periods of time. The dynamics of mentoring relationships change over the course of time (Ensher et al., 2003; Johnson-Bailey & Cervero, 2004). The nature of social presence within online mentoring relationships may change as well. Second, trust is an essential element in mentoring relationships (Johnson-Bailey & Cervero, 2004). The process of building trust requires more time in an online environment (Tu & McIsaac, 2002). A greater body of empirical research is needed to assess the relationship between social presence, flaming and trust. For instance, would a single instance of flaming destroy an online mentoring relationship for good? How can online mentors and protégés recognize early signs of flaming? Additionally, de Greef and Ijsselsteijn (2001) made a case for the ability of video to increase social presence, but what is the relationship between social

presence and flaming? In particular, would certain forms of CMC decrease the likelihood of flaming?

The literature described in this subsection does not address issues of social presence in terms of cross-gender online mentoring relationships. Both de Greef and Ijsselsteijn (2001) and Harms (2005) used same-sex pairs in their experiments. The women pairs on average had higher levels of social presence than did the men in de Greef and Ijsselsteijn's (2001) study. Further work is needed to determine whether these same results would hold true for cross-gender interaction.

Teacher induction and telecommunications

In order to illuminate the specific facets of online mentoring, I provide some examples of online mentoring for the process of teacher induction. These examples highlight the opportunities and challenges of online mentoring within a specific profession. Prior to discussing the role of telecommunications or CMC in teacher induction, I first need to describe the issues of high attrition and teacher quality within the teaching community. These two issues serve as the impetus behind teacher mentoring programs. These issues are important considerations for online mentoring relationships between teachers as well. After discussing these issues, I address the literature on teacher induction through telecommunications. Consideration of the two issues facing the teaching community will serve as the fulcrum for critiquing the literature on teacher induction and telecommunications.

As described in the previous section, the attrition rate of new teachers is very high. Fifty percent of new teachers leave the profession within the first five years (Abbott, 2004; Dove, 2004; McGlamery & Edick, 2004). This attrition rate is much higher within high poverty schools (Dove, 2004). Emotional and psychosocial support of mentors can help in minimizing

the stresses new teachers face. New teachers face tremendous pressure as they are often given the most difficult students, additional responsibilities like monitoring students during lunch as well as being placed in isolated work environments (Abbott, 2004). The emotional support provided by mentors can relieve feelings of isolation that new teachers have (Dove, 2004). Collegial relationships formed with mentors also helps in relieving stresses faced by new teachers (Gersten, Keating, Yovanoff, & Harniss, 2001).

Although providing emotional support to new teachers is vital, this is not the only issue at stake for the teaching community. Wang and Odell (2002) stated, "the assumptions underlying mentoring programs are often not on standards (learning to teach) but on emotional and technical support" (p. 481). They described several roles the mentor can play in helping the new teacher learn to teach. Mentors need to help new teachers understand the problems posed by current teaching practice. Mentors should understand the subject matter thoroughly as well as understanding methods for teaching the subject matter to diverse cultures. Mentors should ultimately help new teachers (protégés) understand the relationship between educational theory and practice.

The mentor's role in teacher induction is one of striking an appropriate blend between the quantitative (keeping new teachers in the profession) and qualitative (ensuring new teachers can teach effectively to the standards). Abbott (2004) noted that new teachers need the most help in remaining in the profession and improving their skills as a teacher. How would telecommunications or CMC help in addressing this set of blended concerns? In other words, how might the online mentor provide emotional support while helping the new teacher learn to teach?

Katherine Merseth conducted some of the earlier work on using telecommunications for teacher induction (Merseth, 1990; Merseth, 1991). Her work involved the study of the Beginning Teacher Computer Network (BTCN) at Harvard University. The study was conducted in the academic years from 1987 to 1990. The Beginning Teacher Computer Network connected thirty-eight graduates of three specific teacher education programs, two university faculty members, one education program administrator, a graduate student teaching assistant that was also an experienced teacher and invited guests through an electronic discussion board and e-mail system. Data collected from both interviews and questionnaires revealed that the participants found the BTCN most effective at providing moral support and least effective at providing help with developing lesson plans. The privacy of the network added to the feelings of emotional support in that the participants could discuss issues in a much more candid way than in their local school system.

The University of Texas developed an online mentoring program entitled Welcoming Interns and Novices with Guidance and Support (WINGS). WINGS provides online mentoring support to pre-service and beginning (first two years of teaching) in-service teachers. Under the WINGS program, these pre-service and beginning teachers communicate via e-mail with experienced teachers at another location. In her dissertation, Abbott (2004) explored the impact WINGS had on inducting new teachers through interviews with online mentor/protégé pairs that had participated in WINGS from 15 to 23 months. Additional data she used included e-mail logs and questionnaires participants completed prior to joining WINGS. The primary theme that emerged from her data was that WINGS allowed for new teachers to receive emotional support without fear of reprisal. For example, participants were often reluctant to ask questions of local mentors because they were afraid their local administration would evaluate them negatively.

Another theme from her study was the importance of emotional support provided through WINGS. The new teachers in the study "wanted to feel they were valued as unique and individual persons" (p. 201).

Lynch (2003) researched the impact of an online mentoring course on the beliefs the teachers had about serving as online mentors. She measured the interest in serving as an online mentor before and after the course. Surprisingly, there was a significant decrease in the interest of being an online mentor after the course was complete. One naïve inference from the statistical data would place the course at fault (i.e, the reduction of interest in serving as an online mentor was caused from the poor quality in the course). She investigated this data further and found the participants were significantly busier at the end of the course (i.e., completing finals, completing degree requirements, etc.) than they were at the beginning of the course. The amount of time the mentor has influences their decision to serve as an online mentor. For this reason, an individual's interest in online mentoring will most likely fluctuate as a function of the time they have to serve as an online mentor.

Singer (2005) conducted an ethnography on a listserv during a pre-service teachers' practicum experience. She used observations, interviews and questionnaires, but the bulk of her data was contained in 3,149 listserv messages from 83 student teachers and 10 university supervisors. The stresses faced by new teachers was a predominate theme within the listserv messages. They expressed feelings of insecurity and lack of control that resulted in the pre-service teachers wondering whether they could actually be a teacher. Because all members of the group were going through the same experience, the listserv was a location where students could provide emotional support and empathy. For instance, four students were able to share

similar experiences regarding problems with classroom attendance and their methods for dealing with these problems.

Additionally, the asynchronous nature of the listserv provided a space where each student teacher could reflect on his or her teaching practice. For instance, one student (Eric) debated the strengths and weaknesses of having his students read a poem while in class versus at home. Various students responded to the listserv message. Some advocated his initial approach while others demurred. The listserv dialogue provided Eric with a space to reflect upon the approach he most preferred.

The potential of online mentoring in rural school areas is a topic of interest. Price and Chen (2003) explored the impact of online mentoring in a school system in a remote area of western Texas. They used discussion boards as a platform to connect pre-service teachers, supervising teachers and university faculty. Due to technical problems, they were unable to have a fully functional system until nine weeks into a fourteen-week semester. Because of these problems, they were unable to research the actual system in operation, but they did offer suggestions to improve their future design. Their future design consisted of three separate discussion boards: a peer online mentoring system for the pre-service teachers only, a section for supervising teachers only and a public discussion board for all pre-service teachers, supervisors and university faculty.

Wang and Odell (2002) noted the focus of many teacher mentoring programs is on providing emotional support. They considered this focus on emotional support to be at the expense of helping new teachers learn to teach. The emphasis of the online mentoring programs described here (Abbott, 2004; Merseth, 1991; Singer, 2005) is primarily on providing emotional support as well. The importance of providing emotional support to new teachers can not be

denied (Dove, 2004). The emphasis on providing emotional support involves concerns of the high attrition rates associated with stressful environments new teachers face. At the same time, Wang and Odell (2002) made compelling arguments regarding external pressures regarding the need for mentors to help new teachers learn to teach. Such pressures include the fact that a lack of teaching knowledge "is often counted as one of the important causes of the unsatisfactory academic performance of American students at the national level" (Wang & Odell, 2002, p. 483). Online mentoring programs for new teachers should help in developing the teaching skills of new teachers. Online mentors should not strictly focus on helping new teachers learn to teach because providing emotional support is considered vitally important to new teachers (Abbott, 2004; Dove, 2004). For instance, although many beginning teachers in Abbott's (2004) study initially saw their online mentor's primary role involving helping them learn to teach, they later described the emotional support received from their online mentor as essential.

Discussion

Online mentoring relationships are ones where the mentor and protégé communicate via computer-mediated communication (CMC) rather than face-to-face. Ensher et al. (2003) stated an incredible growth in the number of online mentoring program has occurred in recent years. Despite this growth, research has not kept pace to substantiate hypothesis regarding the potential of this new phenomenon (Bierema & Merriam, 2002; Ensher et al., 2003). Jacobi (1991) described the need to prescribe a set of theoretical frameworks to explore the vast number of face-to-face mentoring programs that existed at the time. With the growth of online mentoring programs, I recommend the use of several theoretical frameworks to evaluate the quality of online mentoring programs. The three theoretical frameworks I proposed in this chapter are

social exchange, power and social presence. I describe key questions regarding online mentoring which emerge from the research literature I reviewed.

Social exchange denotes the idea that both the mentor and protégé should receive benefits from the mentoring relationship. The focus on many of the research articles regarding online mentoring is on social exchange (Abbott, 2004; Duff, 2000; Sanchez & Harris, 1996). For instance, Duff (2000) described how online mentoring allowed young girls to learn about science from practicing female scientists. At the same time, the practicing female scientists felt that e-mail allowed them to make a contribution while having the flexibility to not interrupt their busy work schedules. The emphasis of the research on social exchange in online mentoring is understandable because reciprocity is an important element of mentoring relationships (Ensher et al., 2003; Johnson-Bailey & Cervero, 2004; Thomas, 2001). The literature I found regarding social exchange in online mentoring relationships was not longitudinal. Some longitudinal questions regarding social exchange in online mentoring includes:

- Are the benefits mentors and protégés obtain from online mentoring relationships long-term? For example, can online mentoring relationships impact a new teacher's teaching practice throughout his or her career?
- Does the nature of these benefits change over the course of the online mentoring relationship?

Ensher et al. (2003) proposed that prior mentoring and online relationships would impact one's willingness to participate in online mentoring relationships. In other words, they hypothesized that persons having beneficial prior online relationships would be more likely to participate in online mentoring relationships. From this hypothesis, another question for social exchange in online mentoring relationships is

- How does prior experiences with mentoring and computer-mediated communication influence one's willingness to participate in an online mentoring relationship?

As noted by Lynch (2003), the amount of time the individual has available at the moment will also influence willingness to participate in an online mentoring relationship. For this reason, responses regarding willingness to participate in online mentoring relationships may depend on when you ask the individual.

Most of the literature in this review regarding social exchange did not discuss the benefits that sponsoring organizations of mentoring programs seek. Because sponsoring organizations like state governments provide funding for mentoring programs, the support of these sponsoring organizations is key to the survival of mentoring programs (Abbott, 2004). In considering social exchange for sponsoring organizations, an important research question is

- What benefits from online mentoring programs do sponsoring organizations seek?

Power focuses on the greater ability that the mentor has to control the flow of the relationship and the implications of this control the mentor has. Although power is often seen in a negative way, power is actually a neutral term (Darder, 1996). The mentor can use power positively or negatively. The mentor can use power in negative ways through cultural reproduction to reinforce existing cultural norms. The mentor can use power in positive ways through cultural production to help the mentor and protégé understand each other's cultural histories. In gaining this understanding, the mentor and protégé can contribute to developing new ways for treating non-mainstream groups. In the spirit of cultural production, dialogue between the mentor and protégé involving cultural histories is key to building trust in multicultural cultural relationships (Johnson-Bailey & Cervero, 2004). At the same time, dialogue involving cultural histories and building trust may be more difficult in online settings (Ensher et al., 2003; Tu & McIsaac, 2002).

- How do online multicultural relationships structure dialogue around issues involving culture?

Social presence measures the perceived salience of physical characteristics, messages and actions of individuals participating in computer-mediated communication (CMC). In general, the literature reviewed here on social exchange and power address issues on mentoring but not in the context of online relationships. In contrast, the literature reviewed here on social presence generally focuses on online relationships but not in the context of mentoring. A blend of social presence with the other two theories may prove useful in researching online mentoring.

- Would lack of social presence from CMC benefit mentors and protégés (social exchange)?
- As noted by Ensher et al. (2003), would lack of social presence from CMC provide greater access to mentors for women, people of color and persons with disabilities (power)?

The literature within this review regarding online mentoring focused on a particular form of CMC like e-mail (Abbott, 2004; Duff, 2000; Sanchez & Harris, 1996), listservs (Singer, 2005) and discussion boards (Merseth, 1991). Articles in this review did not compare the features that various forms of CMC would offer to online mentoring relationships. For instance, do particular forms of CMC offer greater social presence that might enhance the building of trust? Would lack of social presence prove beneficial or detrimental to online mentoring relationships?

- What are the features offered and constraints posed by various forms of CMC on mentoring relationships?
    - Does CMC provide greater access to mentors?
- Do certain forms of CMC have a greater risk for flaming?

- What are the implications for flaming in an online mentoring relationship?

With these questions in mind, I will conclude with some recommendations for general methodological approaches for these questions. Because both quantitative and qualitative techniques have both strengths and weaknesses, Goldman et al. (2005) recommended a quisitive (or mixed-method) approach to researching online learning networks. In the context of online courses, both quantitative information in the form of test scores and quantitative information in the form of student evaluations is available (Arbaugh & Hiltz, 2005). Unfortunately, online mentoring programs do not follow the structure of an online class so test grades would not be a component of data for online mentoring research. However, evaluations from the online mentor and protégé are a plausible method for measuring the quality of the online mentoring relationship. With respect to the four theories described in this chapter, the following information is useful for consideration.

- What benefits did you seek/obtain from the online mentoring relationship (social exchange)?
- What did you learn during the course of the online mentoring relationship?
  - In what ways can you perform more effectively in your profession?
- Were any of the issues you discussed related to culture?
  - What impact did this have on your multicultural awareness (power)?
- In comparison to your previous face-to-face mentoring relationships, describe how closely connected you felt to your online mentor/protégé (social presence).

I recommend more longitudinal work in exploring issues involving online mentoring. Arbaugh and Hiltz (2005) stated that the newness of online education creates a research environment where the number of longitudinal studies is extremely small. Lynch (2003)

described how perceptions regarding online learning change over time. Additionally, Barnett (2002) recommended further longitudinal work in the area of online learning to differentiate between perceived and actual learning.

Based on my literature review, there is no literature regarding the use of power in online mentoring relationships to my knowledge. Johnson-Bailey and Cervero (2004) provided an example that may be useful for researching power in the context of online mentoring relationships. They provided a longitudinal perspective on the nature of power and dialogue in their multicultural face-to-face mentoring relationship. I believe a similar approach involving a multicultural online mentoring relationship would be very useful.

Some quantitative instruments are presently available to help in this research. This is particularly true regarding research issues involving social presence in online mentoring. Harms (2005) developed a research instrument to assess all six dimensions of social presence (co-presence, attentional allocation, perceived message understanding and perceived affective understanding, perceived affective interdependence and perceived behavioral interdependence). His instrument was highly reliable with all six dimensions having alpha reliabilities of at least 81%. de Greef and Ijsselsteijn (2001) developed a research instrument to measure co-presence through a series of bi-polar questions on a scale of 1-7.

I believe it is very important research is conducted in actual online mentoring settings rather than experimental conditions. The experimental nature of some of the studies (e.g., de Greef & Ijsselsteijn, 2001; Harms, 2005) makes it difficult to translate their findings into the context of online mentoring. All the pairs of participants in de Greef and Ijsselsteijn's (2001) were friends. Online mentors and protégés may not initially be friends. Issues involving flaming that occurred

in Singer's (2005) study were in the natural context of teachers learning from each other through listserv interaction.

Looking ahead: Chapter three

Chapter two described three theoretical frameworks (social exchange, power and social presence) for researching online mentoring programs. From the discussion of these three theoretical frameworks, I proposed a series of research questions for online mentoring. These questions were formed on the basis of limitations from the literature I reviewed in addressing online mentoring issues. Chapter three will describe my methodology in dealing with a set of three questions that are subset of the questions described in the discussion section of chapter two. These questions are treated in the context of teacher's professional development.

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CHAPTER 3

METHODOLOGY

Overview

The purpose of this chapter is to provide a description of the methodology I used in conducting my dissertation study. I describe the research questions of interest, my subjectivities, the data collection procedures, analysis techniques and my rationale for the methodological choices I made. The research questions address the opportunities and challenges of using online mentoring for the professional development of teachers. I used both an online survey and tape-recorded interviews as methods of data collection. Descriptive statistics were calculated from the online survey as a preliminary approach for noting important trends to question further in the interviews. Taxonomy analysis (LeCompte, 2000) and open coding (Strauss & Corbin, 1990) were used to produce the themes with respect to the research questions.

Research Questions

My dissertation addresses three questions relative to online mentoring programs for the professional development of teachers.

1) How do prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs?
2) What are the affordances offered and constraints posed by various forms of CMC on mentoring relationships for teachers?
3) How does CMC impact the access to mentors for teachers?

Data collection procedures

Multiple methods

My chief motivation for a multiple analytical approach (quantitative and qualitative) stemmed from a goal to achieve some measure of triangulation. Triangulation "refers to the combinations and comparisons of multiple data sources, data collection and analysis procedures, research methods, and/or inferences that occur at the end of a study" (Tashakkori & Teddlie, 2003, p. 717). The literature described several benefits from triangulation in the context of mixed methods studies.

Mixed methods provides a means of achieving corroboration, elaboration, development and initiation in the study of social phenomenon (Rossman & Wilson, 1994). Corroboration is similar to the idea of triangulation in conveying the notion of consistency in findings between different methods. Mixed methods provide elaboration through expounding upon ideas conveyed in a single method and lending "strength to an argument and (providing) alternative perspectives" (Rossman & Wilson, 1994, p. 321). Mixed methods provide development in that results from one method inform the development of the use of the next method. Initiation is provided through mixed methods as "the results from one method foster new lines of thinking…and (suggesting) alternative ways to pose a research question" (Rossman & Wilson, 1994, p. 323).

Kaplan and Duchon (1988) provided an example in their own mixed method work regarding initiation. They had difficulties in finding statistically significant differences in the perceptions of an information system across various health organizations. The lack of statistical significance between hospitals from the quantitative results was quite perplexing given that the interviews showed marked differences in how various staff members perceived the new

information system. Upon further review of the transcripts, they realized these differences were associated with the job function rather than the location of the individual. Upon performing statistical comparisons based on job function, the quantitative analysis did reveal statistically significant differences existed in perceptions of the new information system. In this respect, the qualitative analysis provided a different perspective for performing statistical analysis. Triangulation provides greater scope and depth to the study (LeCompte & Preissle, 2003). In particular, "Triangulation prevents the investigator from accepting too readily the validity of initial impressions: it enhances the scope, density, and clarity of constructs developed during the course of the investigation" (LeCompte & Preissle, 2003, p. 48). Triangulation, sought through the mixed methods approach, provides a means of comparing results obtained in different ways. In addition, "the most desirable design involves the amalgamation of two or more of the seven ideal-typical models (e.g., surveys, interviews and focus groups) – typical models in a kind of triangulation" (LeCompte & Preissle, 2003, p. 35).

Materials

Three research instruments were used to collect data for my dissertation study.

1) Online Survey (Appendix C). This guide shows the questions asked in the survey and the variable names I used within the Statistical Package for the Social Sciences (SPSS), version 12.
2) Semi-structured Individual Interview Guide (Appendix D)
3) Semi-structured Paired Interview Guide (Appendix E)

The online survey was conducted to provide some initial insight into the relationship between prior mentoring experiences with mentoring and CMC and willingness to participate in online mentoring relationships. The sample means from the survey were used as an approach to

develop questions for the interviews. Trends in the survey data were explored further during the interviews. For instance, the online survey data alerted me that I needed to explore unusual relationships that emerged regarding participant's comfort level and willingness to learn more about e-mail and video teleconferencing. Without this preliminary statistical data, I would not have had the same level of insight into questions I should ask during the interview process.

Interviews were used because I believe interviews are a method that allow for "in-depth exploration" (Mitchell, 1999, p. 36). Additionally, interviews allow for the exploration of phenomenon that the researcher cannot immediately detect like feelings, perceptions and emotions (Patton, 2002). After deciding upon the use of interviews, I realized three broad types of interviews were available: structured, semi-structured and unstructured. My choice of conducting semi-structured interviews was one based on balancing the strengths and weaknesses of structured and unstructured interviews.

While conducting my pilot study, the structured interview did not have the flexibility to probe for further elaboration from the participants. The structured interview in many ways resembles a survey. If the researcher seeks for the participants to respond to the same set of questions, Shank (2002) recommended the use of a survey in lieu of structured interviews. He felt distribution of surveys is a much more efficient means of conducting a standardized approach to research. Although structured interviews lack flexibility, structured interviews are systematic (Patton, 2002) in that the research questions are addressed, and the researcher can compare participant's responses to the same question.

In contrast, an unstructured interview provides a high degree of flexibility. The unstructured interview is centered on the interviewee's perspective rather than the researcher's perspective. During the unstructured interview, data is obtained from the individual's

circumstances (Patton, 2002). At the same time, unstructured interviews possess the risk that the data does not properly address the research questions. The risk of not addressing my research questions properly was my greatest concern with using unstructured interviews.

After reflecting on the relative merits of structured and unstructured interviews, I decided that semi-structured interviews provide an appropriate blend of the strengths of structured and unstructured interviews. Semi-structured interviews possessed some of the flexibility contained within the unstructured interview. With the semi-structured interview, I could ask probing questions depending on the context of the interviewee's responses. These probing questions were not the same for every interview, but probes provided the opportunity for the interviewee to elaborate on his or her responses. At the same time, the structure of the semi-structured interview increased my confidence that I would address my research questions.

Table 3.1 displays the relationship between the research questions, the relevant research material used and the method of analysis. Research questions 1 and 2 were addressed using both the online survey and the interviews while research question 3 was addressed using the interviews only. Descriptive statistics (e.g., sample means) were collected from the online survey as a preliminary method for noting unusual or interesting trends to investigate further in the inductive analysis. Inductive analysis was used to develop themes from the interviews with respect to each research question.

In some cases, only certain portions of the research instruments were used in addressing a particular research question. Although the online survey in its entirety treated question 1, only questions 4-8 that described the participant's comfort level, perceived usefulness in communicating with others and willingness to learn about new features in various forms of CMC specifically treated research question 2. In addition, certain questions from the interview guides

dealt with specific research questions. For instance, question 3 of the interview guide asked the interviewee to describe prior experiences with technology in an effort to address the second research question.

Research Question	Data Source	Analysis
1) How do prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs?	Online Survey (Appendix C)	Descriptive Statistics (e.g., contingency table of willingness to be an online mentor versus willingness to be an online protege)
	Individual Interviews (Appendix D): Questions 1 – 4 Paired Interview (Appendix E): Questions 1 - 5	Inductive/Taxonomy Analysis
2) What are the affordances offered and constraints posed by various forms of CMC on mentoring relationships for teachers?	Online Survey: Questions 4-8	Descriptive Statistics
	Individual Interviews: Questions 3 and 4 Paired Interview: Questions 3 and 4	Inductive/Taxonomy Analysis
3) How does CMC impact the access to mentors for teachers?	Individual Interviews: Question 2 Paired Interview: Question 3	Inductive/Taxonomy Analysis

Table 3.1. Relationship of Data to Research Questions

Development of online survey

Ensher, Heun and Blanchard (2003) proposed that "Proteges' and mentors' past experiences with online relationships and interest in mentoring relationships will significantly predict the likelihood of their being willing to become engaged in a mentoring relationship online" (p. 272). Their proposition was the genesis for my first research question. My goal in exploring the first research question through the survey was to address three areas: prior

mentoring relationships, prior CMC experiences and willingness to participate in online mentoring relationships in the future. In my initial development of the survey, I focused on the readability of the survey (i.e., three distinct blocks of questioning in order).

Because I planned to capture qualitative data during the interviews, I wanted the online survey to provide some initial quantitative information with respect to the first research question. As I considered prior mentoring experiences, I wondered how I would quantify a qualitative experience like mentoring. What questions would be the easiest for participants to answer quantitatively regarding their prior mentoring experiences? Because definitions of mentoring vary (Jacobi, 1991), I believed it was important to provide a definition of mentoring to the participants to use for their responses. With this definitional framework, I felt the participants could count the number of times they have been a mentor or protégé within the last three years (questions 1-2). I asked the question in terms of the last three years in order to have a consistent timeframe that was recent enough for the participants to recall. Some form of a Likert-scale question seemed to be a straightforward approach to quantifying prior mentoring relationships. I subsequently decided to ask the participants to rate their prior mentoring relationships on a scale of 1-5 (question 3).

Because much of the literature on online mentoring focused on the use of e-mail (e.g., Duff, 2000; Ensher et al., 2003; Sanchez & Harris, 1996), I wanted to measure participant's prior experiences using a variety of forms of computer-mediated communication (CMC). Gal-Ezer and Lupo (2002) noted that attitudes regarding different forms of technology vary. For this reason, I felt it was important to measure the comfort level participants had for various forms of technology (questions 4-8). In addressing research question 2, I also wanted to assess the participant's perspectives regarding the ability of each form of CMC to enhance the

communication process and their willingness to use CMC (questions 4-8). In assessing the participant's prior experiences with CMC, I wanted to quantify the degree to which the participants used various forms of CMC on a regular basis (questions 9-20).

The primary variable of interest for the first research question was the willingness of participants to participate in online mentoring relationships. Questions 23 and 24 seek to measure the willingness to participate in online mentoring relationships in the future. In addition, I wanted to obtain data on the participant's prior experiences with online mentoring relationships (questions 21-22). Although no demographic information was collected on the online survey participants, I wanted to differentiate between the perspectives of pre- and in-service teachers (question 25).

My next goal in the survey development was to assess the validity of the survey. Did the survey offer an accurate portrayal of the participant's perspectives of prior mentoring relationships, prior CMC experiences and willingness to participate in online mentoring relationships? Because my idea for the first research question came from Ellen Ensher's article (Ensher et al., 2003), I felt it was important to determine if I had captured their intentions in the research proposition. I initially contacted Ellen Ensher via e-mail, and we subsequently discussed the questions over the phone. During the course of our phone conversation, she provided some suggestions for improving the survey. For instance, my original version of the survey only asked if the participants would be willing to participate in an online mentoring relationship in the future. She thought there might be some differences in willingness to be an online mentor versus an online protégé. I subsequently decided to ask two questions regarding willingness to be either an online mentor or an online protégé.

Sampling strategies

I received approval from the Institutional Review Board (IRB) to use the recruitment letter shown in Appendix A. I distributed the recruitment letter through several listservs: the Instructional Technology listserv (EDIT-L), the Technology Integration Program listserv and the Qualitative Inquiry User Group (SQUIG) listserv. In addition, I distributed hard copies of the recruitment letter in several education classes. The participants in this study were not selected randomly.

The recruitment letter referred interested participants to the website containing the consent letter to the study. The IRB granted approval for implied consent from the online survey participants. The implied consent form is shown in Appendix B. After agreeing to the terms of the research, the participant selected the "Begin the Survey" button. As an incentive, I specified I would randomly select two of the online survey participants to receive a $50 gift certificate to amazon.com. During the course of the survey, the participant had the right to not complete the survey by either selecting the "Cancel" button or closing their web browser. The online survey was available for a period of two months (December 2004 – January 2005). Once the participant completed the survey (questions shown in Appendix C), the participant saved their responses by selecting the "Save and Submit" button. Once the participant submitted his or her responses, the participant was asked if he or she would like to participate in the $50 amazon.com gift certificate drawing. Online survey participants expressed their willingness to participate in the drawing via e-mail.

A convenience sample was used for the distribution of the recruitment letter and obtaining online survey participants. The recruitment letter was distributed to listservs of which I was a member and education classes taught by professors that I knew. Although I specified in

the recruitment letter that the study involved pre- and in-service teachers, there was no mechanism to prevent others individuals from participating in the online survey. Forty-eight individuals participated in the online survey. I have no information regarding the identity of any of the online survey participants (e.g., name, age, gender). No mechanism was present within the online survey to prevent individuals from taking the survey more than once. The uniform resource locator (URL) for the online survey was only provided in the recruitment letter that was distributed to specific listservs and education classes. The URL for the online survey cannot be "Googled." ®

After the participant submitted his or her online survey responses, the online survey participant was asked if he or she would like to participate in an individual interview. As an incentive, the participants were told that participants in the interview would receive a $10 gift certificate to Blockbuster. I requested that individuals that were interested in participating in an interview contact me via e-mail. Purposeful sampling from 8 volunteers was used to obtain interviewees in that I only selected interested individuals that were either pre- or in-service teachers. For example, I politely declined a potential interviewee that had recently changed her major from teacher education.

Although the convenience sample I used for collecting online survey data was not statistically sound, this sampling strategy was used to address a challenge for collecting the qualitative data: obtaining access into the participant's world. The challenges of gaining entry into the research site are not unknown to qualitative researchers (e.g., Gamradt, 1998; Oran, 1998). Gamradt (1998) described the challenges she faced in gaining entry into researching the medical field because she was not a doctor. Because I have no prior experience as a K-12 teacher, I felt my gaining entry into the researching the mentoring process of teachers would also

be challenging. I felt advertising my study via a convenience sample would produce the greatest number of interviewees that met my purposeful sample criterion (pre- and in-service teachers).

The interviews lasted approximately one hour and were tape-recorded. Each of the interviews was transcribed with the exception of one interview (Dana) in which the tape-recorder malfunctioned. Due to the malfunctioning of the tape recorder, I excluded Dana from the analysis. In addition, I conducted a paired interview with two individuals. One of the participants (Betsy) participated in both an individual interview and the paired interview. Six individuals participated in the interview process, and five transcripts were produced.

Data analysis

I followed a mixed methods approach (quantitative and qualitative) for the analysis of my data. Quantitative techniques were used for the analysis of the online survey data. Qualitative techniques were used for the interview transcripts.

Quantitative

Descriptive statistics were used to illustrate various facets of the online survey data. Sample means were calculated for each question grouped by those willing to be an online mentor, those not willing to be an online mentor, those willing to be an online protégé and those not willing to be an online protégé. In addition, contingency tables provided counts of various characteristics of the participants. One contingency table portrayed the numbers of pre- and in-service teachers willing to be online mentors. Another contingency table displays the numbers of pre- and in-service teachers willing to be online protégés. I provide counts of the number of individuals willing to be online mentors in comparison to the number of individuals willing to be online protégés. Histograms will visually portray frequencies of various responses for

perspectives regarding comfort level, usefulness of communicating with others and willingness to learn about new features for various forms of CMC.

Qualitative

I began my analysis by conducting an open coding process of my transcripts. Strauss and Corbin (1990) noted open coding generates codes from the data. The initial phase of the open coding process started through the use of in vivo codes or the "words of the respondents themselves" (Strauss & Corbin, 1994, p. 105). Because the initial code listing started to become too long, I consolidated these codes into a new code that described the similarities between a set of separate codes. For instance, four separate codes existed in the data called "encouragement," "improve a person's self confidence," "learning to be a better person," and "set a good example." These codes described some of the perceived roles of a mentor so I consolidated these codes into a code called "Mentor Roles."

My next step of analysis was to establish a connection between my research questions and my consolidated listing of codes. Strauss and Corbin (1990) defined a category as "concepts that stand for phenomena" (p. 101). I looked for relevant categories that might exist within my research questions. Three categories were the most salient to me from my research questions: Mentoring, CMC and Online Mentoring. I then looked for a match between my categories from my research questions and the consolidated codes I created from my data. In order to address research question 2, I created five codes that did not belong to any category: e-mail, instant messaging, discussion boards, chat rooms and video teleconferencing.

Tables 3.2 – 3.4 display a description of the consolidated codes I used for analysis of the categories Mentoring, CMC and Online Mentoring respectively. For instance, I placed all of my codes related to prior mentoring experiences under the category Mentoring. Although my codes

were derived from my data, the categories were developed from my research questions. I used Tables 3.2-3.4 as a framework for relating my codes to my categories and subsequently my research questions.

Category: Mentoring- This category describes the participant's previous experiences with mentoring.		
	Codes	Description
	Serving as a mentor	This code describes instances where the participant was a mentor for someone.
	Serving as a protege	This code describes instances where the participant had someone mentor them.
	Mentor Access	This code describes the process participants used to find mentors.
	Mentor Roles	This code describes the participant's perspective regarding things that are important for the mentor to provide (i.e., emotional support).
	Mentoring Goals	This code describes important end outcomes from mentoring relationships
	Social Exchange	This code describes the reciprocal benefits from mentoring relationships (e.g., reciprocal learning)

Table 3.2. Placement of Consolidated Codes for the Category Mentoring

Category: CMC – This category describes previous experiences the participant has had in communicating with others through CMC		
	Codes	Description
	CMC Methods	The code describes the types of CMC the participant has used and how it is used.
	CMC Perspectives	This code describes perspectives regarding the use of a particular type of CMC.
	CMC Social Presence	This code describes the participant's perspective regarding the social presence offered by a particular form of CMC.

Table 3.3. Placement of the Consolidated Codes for the Category CMC

Category: Online Mentoring – This category describes the participant's previous experiences with online mentoring and perspectives regarding online mentoring.		
	Codes	Description
	Serving as an online protégé	This code describes instances where someone online mentored the participant.
	Serving as an online mentor	This code describes instances where the participant mentored someone online.
	Online Mentoring goals	This code describes what is important to accomplish in an online mentoring relationship.
	Methods for online mentoring	This code describes the manner in which the participant uses CMC.
	Online Mentoring Perspectives	This code describes the participant's perspectives regarding the ability of CMC to meet the needs of a mentoring relationship.

Table 3.4. Placement of the Consolidated Codes for the Category Online Mentoring

After establishing a method to relate my data to my research questions, I finally needed a method to use my codes and categories to find a set of themes relative to each research question. Spradley (1979) developed the initial ideas behind taxonomy analysis which involved a structure of semantic relationships. Taxonomies are a means of displaying "properties shared among units belonging to other categories" (LeCompte & Preissle, 1993, p. 244). Each of my research questions seeks to describe a relationship between my three categories I created. These

relationships are established on the basis of particular codes I used during the open codng process. Research question 1 addresses the relationship between the categories Mentoring and CMC to Online Mentoring. Research question 2 expounds upon the relationship between the categories Mentoring and CMC. The relationship between the categories Mentoring and Online Mentoring addresses research question 3.

LeCompte (2000) provided a tabular means of representing taxonomies. She described a two-column table with the left-hand column displaying the taxonomy name while the right-hand column displayed the items from the data that described the taxonomy. I followed a similar approach in finding the themes for my research questions. Tables 3.5 – 3.8 display my taxonomies in terms of the research question and the items that emerged with respect to the research question. I used the consolidated codes as my unit of analysis to find the items within the tables.

Taxonomy (Related to Research Question 1)	Items
How do prior experiences teachers have with mentoring influence their willingness to participate in online mentoring programs?	Phrases coded as - Serving as a mentor - Serving as a protégé - Social Exchange - Serving as an online protégé - Serving as an online mentor - Online Mentoring goals - Methods for online mentoring - Online Mentoring perspectives

Table 3.5. Taxonomy for Research Question 1a

Taxonomy (Related to Research Question 1)	Items
How do prior experiences teachers have with CMC influence their willingness to participate in online mentoring programs?	Phrases coded as - CMC Methods - Serving as an online protégé - Serving as an online mentor - Online Mentoring goals - Methods for online mentoring - Online Mentoring perspectives

Table 3.6. Taxonomy for Research Question 1b

Taxonomy (Related to Research Question 2)	Items
What are the affordances offered and constraints posed by various forms of CMC on mentoring relationships for teachers?	Phrases coded as - CMC Perspectives - CMC Social Presence - Mentor Roles - Mentoring Goals - Social Exchange - E-mail - Instant messaging - Discussion boards - Chat rooms - Video teleconferencing

Table 3.7. Taxonomy for Research Question 2

Taxonomy (Related to Research Question 3)	Items
How does CMC impact the access to mentors for teachers?	Phrases coded as - CMC Perspectives - Mentor Access

Table 3.8. Taxonomy for Research Question 3

LeCompte (2000) also noted that taxonomy analysis proceeds by finding patterns that exist in the items in the taxonomy. I defined a theme as any item that was placed in the taxonomy by three or more interviewees.

Computer software (NVivo)

NVivo 2.0 was used in conducting searches through my transcripts. The literature urges caution when using Computer Assisted Qualitative Data Analysis Software (CAQDAS). Bringer, Johnston, and Brackenridge (2004) noted that the use of CAQDAS may tempt the researcher to make changes to his or her theoretical frameworks or methodological choices. For instance, NVivo has a number of display features useful for the analysis of structured interviews. The researcher should not make the choice to conduct structured interviews solely on the basis of what NVivo can do.

I used NVivo in the later stages of my analysis after making my design choices and completing the categorization of my data. I used NVivo primarily to handle the administrative tasks of qualitative analysis. These administrative tasks included searches for codes and memo writing. I believe the allocation of the administrative tasks to NVivo allowed me to focus on other tasks like taxonomy analysis.

Rationale for qualitative analysis method used

My search for an analytical method was one that addressed two goals. First, the analytical method should make use of the data that I had. At the same time, I looked for a method that would relate the data to my research questions. Open coding as described by Strauss and Corbin (1994) provided a means of centering my analysis on the data. At the same time, taxonomy analysis provided a link between the categories of the research questions and the units of coding within the data (LeCompte & Preissle, 1993). I also wanted an analytical approach

that provided a clear definition of the process I used in defining themes. Ryan and Bernard (2000) stated that themes are difficult to define and several methods exist for finding them. I believe that LeCompte's (2000) description of the process of finding patterns in the items of the taxonomy provided a concrete approach to finding themes.

Researcher's subjectivities

Peshkin (1988) noted the impossibility of conducting "totally objective" research. This is due to the fact that each researcher brings his/her own set of subjectivities (assumptions) to the research project. For this reason, he stated the importance of declaring one's subjectivities prior to entering a research project. Although the words subjectivity and assumptions imply negative ramifications to sound research, Peshkin (1988) noted the value that our subjectivities contribute to the learning process of research. My own personal subjectivities are listed next.

Previous Experiences with Mentoring

I first needed to reflect upon my own personal experiences with mentoring and the perspectives I've formed from those experiences. Because the participant's experiences with mentoring are not identical to my own, their perspectives on mentoring may differ from my own. I described earlier the manner in which my subjectivities regarding prior mentoring experiences impacted the course of my pilot study.

My experiences as a mentor until now have been very rewarding for the most part. Both of my protégés (from an online mentoring program called Mentornet) are interested in pursuing graduate school and have been very appreciative of my advice. At the same time, I must be careful in assuming all mentors share the same positive experiences as my own. One of the

teachers, Fred, described the lack of mentoring support he received when he began his teaching career. Some of the teachers were suspect of online mentoring relationships as well.

After completing my undergraduate degree, I formed mentoring relationships with some of my former professors. During this time, I did not see myself as being a mentor to anyone else though. As I approached the study, I assumed that all pre-service teachers would have similar experiences. I assumed that pre-service teachers would have lots of stories of professors serving as their mentor, but they would have few stories describing themselves as mentors. The data I collected was quite different from this previously held assumption. The pre-service teachers shared stories of serving as mentors for young children in schools, Cub Scouts and other voluntary organizations. They had a difficult time providing stories of someone being their mentor.

Quantitative versus Qualitative?

Prior to the fall of 2002, all of my experiences with research were predominately quantitative. I was educated, trained and worked as an engineer for over fifteen years. I obtained a master's degree in statistics and was trained in the thought that quantitative analysis was the only "true scientific approach". Upon taking several qualitative courses, I began to see some of the questions that quantitative analysis could not properly address (i.e., perspectives of individuals regarding social phenomenon). Some of my engineering and physics colleagues hold the belief that I once held (quantitative research is the only "real" research approach). I often have to remind myself that questions regarding the relative merits of quantitative and qualitative research really miss the point of conducting research. The method used is not important but rather does the research method address the research question?

An Educator

Hansman (2002) noted problems can exist in mentoring relationships where the mentor and protégé's definition of success differ. This is an important point in considering my subjectivities. As an educator and doctoral student, I must consider my own assumptions regarding education as a "lifelong learning process." I must be aware that some may consider certain temporal elements (finding a job) as important elements of success for education and mentoring processes.

Use of Technology

I have always enjoyed experimenting with new technologies. The Personal Computer (PC) revolution was beginning when I was in high school (in the early 1980's). I was one of the first students at my high school to own a computer (an Atari 800 with 64K of Random Access Memory, RAM; no hard drive and a very slow modem). Many of my colleagues in our doctoral program have the same interest in technology as well. I generally view new technologies as useful until they prove otherwise. My interest in research question 2 involves the ability of innovative forms of technology to address the needs of mentoring relationships. I must be cognizant that traditional forms of CMC (e.g., e-mail) may still have an important place in online mentoring relationships too.

Limitations

Because the survey was not taken in a random fashion, the sample is not representative of the entire teacher population. For this reason, I was cautious with the statistical steps I took in my analysis. Descriptive statistics (e.g., sample averages) were only provided to illustrate features that were present in the forty-eight individuals that participated in the online survey.

Typical statistical procedures that seek to generalize the results to the larger population (e.g., testing for statistical significance) were avoided.

Lynch (2003) found a significant decrease in the number of teachers that were willing to serve as online mentors occurred after the teachers completed an online mentor course. After further investigation through interviews with the course participants, she found the teachers had much less time to serve as mentors at the end of the course. At the end of the course, many of the course participants were trying to complete final assignments and degree requirements. Because I collected both the quantitative and qualitative data at a single point in time for each participant, there is no information available regarding changes in perspectives regarding online mentoring over the course of time.

The use of an online, rather than paper, version of the survey may have limited the types of individuals that participated in the survey. The possibility exists that the views of the non-Internet savvy are not expressed here. I sought to minimize this risk by keeping the process of data entry as simple as possible. Arbaugh and Hiltz (2005) stated the ease of use of online surveys may increase response rates over paper versions of the survey. The online survey eliminates the need for participants to return the survey to me in the mail.

One of the interviewees took part in both an individual and paired interview. Because her data is present in two of the five transcripts, her thoughts may have been overemphasized. Additionally, no specific online mentoring program was used a research site for the study. The qualitative data collected from the interviewees only represents their hypotheses regarding their willingness to participate in online mentoring programs and the impact of CMC on access to mentors. Because context is such a crucial element regarding interviews (Mishler, 1986), my results may have been much different within the confines of an actual online mentoring setting.

The BRIDGE was used to provide some sense of context to the interviewees, but the BRIDGE is not an online mentoring program.

Ethical considerations

I protected the confidentiality of all the participants in my study by using pseudonyms for my participants in any publication and transcripts. I will erase all the tapes used for the individual and paired interviews by August 15, 2007. I will only use the transcripts (with pseudonyms) for any further analysis I do after I erase the tapes. During the paired interview, I reminded the participants of the importance of maintaining confidentiality for their fellow participants.

For the surveys, I published only composite information (e.g., sample means). The online survey had a cancel button to allow participants to not submit their information if they changed their minds. Prior to taking the survey, the participants were reminded that Internet communications were insecure, but I would protect the data once I received it. The surveys are anonymous in that I will have no way to link responses to participants.

For those participants that wished to participate in the drawing, I randomly selected two of the survey participants to receive a $50 gift certificate from amazon.com. Upon completion of the drawing, I destroyed the listing of names and addresses. I did not sell this listing to a mailing list.

Looking ahead: Chapter 4

Chapter 3 described my methodological approach to addressing the three questions of my dissertation research. Chapter 3 covered a number of ideas related to my methodology including

research instruments used, description of the participants, analysis techniques and rationale for my methodological approach. Chapter 4 provides the results of my analysis with respect to my three research questions.

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CHAPTER 4

RESULTS

Overview

The purpose of this chapter is to provide the results of the analysis of my data and align them to the three dissertation research questions that guided this study.

1) How do prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs?
2) What are the affordances offered and constraints posed by various forms of CMC on mentoring relationships for teachers?
3) How does CMC impact the access to mentors for teachers?

I present the results for each question separately within this chapter. I introduce the five interviewees that were the basis for the qualitative analysis. Although the majority of the analysis and results are qualitative, I describe the quantitative results initially where applicable. I enumerate upon the themes for each question that emerged from the qualitative analysis.

The 5 interviewees

The following section provides a brief overview of the five individuals that were interviewed. The names presented are pseudonyms in order to protect the confidentiality of the interviewees.

Alison

Alison participated in a paired interview with Betsy. Some demographic data on Alison includes the fact that she is pre-service teacher majoring in English education. She recently transferred into the teacher education program from another college within her university.

Alison is in her sophomore year of her pre-service teacher education program and desires to teach English at the high school level upon completing her degree.

When asked about her mentoring relationships, Alison stated she recently applied to a program to help adults read. At the time of the interview, Alison was waiting for the response to her application. She described her mother as a role model and a mentor. Alison stated she likes to call her mother to maintain connections with her home. Alison felt this was important because she lives in another state. Alison likes to use instant messaging to stay in touch with her sister, who is still in high school.

Betsy

Betsy participated in an individual interview and a paired interview with Alison. She is a sophomore pre-service teacher that desires to teach kindergarten upon completing her degree. When asked about her mentoring relationships, Betsy stated she mentors a 3rd grade girl. Betsy visits the girl once a week for approximately an hour. They play on the playground and eat lunch together. In conducting her 50 hours of teacher observation, Betsy described the teacher she is observing as a mentor. Betsy felt the teacher provided her with opportunities to learn to teach by engaging her in the class. Betsy appreciated the teacher letting her be more than just a passive observer.

Alison and Betsy described how various forms of technology are used in the course of interacting with others from a distance. They stated they often follow a pattern of first using a listserv, then e-mailing and last using the cell phone. They stated this was the pattern they used for the paired interview. Betsy sent a message to her sorority's listserv. Alison sent an e-mail to Betsy expressing her interest in participating in the paired interview. They called each other on the cell phone to make final arrangements.

Cindy

Cindy participated in an individual interview. Cindy is in her senior year of her pre-service teacher education program. Cindy did not follow the traditional undergraduate path. She first started her degree program in 1985, but she did not go through the program in four straight years. During the course of the interview, Cindy discussed the challenges of the evolving nature of the teaching standards (Quality Core Curriculum standards to Georgia Performance Standards).

While Cindy described her non-traditional undergraduate path, she reflected upon the role her sister has played as a mentor. Cindy stated her sister is working on her doctorate. Cindy noted the perseverance her sister has had in pursuing her educational goals. Cindy stated that her sister's example motivated her to never quit on her degree. When asked about her own role as a mentor, Cindy stated she has served as a mentor in several volunteer organizations like the Cub Scouts and the church.

Fred

Fred participated in an individual interview. Fred is in his 29th year teaching chemistry and physics. Fred has taught at the same high school throughout his teaching career. This is Fred's first year teaching advanced placement chemistry. Fred mentioned one difficulty in teaching advanced placement chemistry is the fact that he had to re-learn calculus. Fred stated interaction with a good college chemistry teacher would be an asset in the process of developing a good advanced placement chemistry class.

Fred stated one of the great challenges he is facing involves the re-design of the teaching standards. Fred participates on a countywide committee to change the Quality Core Curriculum (QCC) to the Georgia Performance Standards. One concern that Fred has regarding the

standards is their adequacy in preparing students for college-level chemistry. He felt the removal of certain elements of the standards under the Georgia Performance Standards would adversely impact his students in college.

Karen

Karen participated in an individual interview. This is Karen's 11th year as a teacher. She presently is the local school technology coordinator (LSTC) in a large elementary school. This is Karen's second school where she has served as LSTC. In the earlier part of Karen's career, she taught mathematics and language arts in middle and high school.

Karen described both her mother and mother-in-law as mentors. They both are principals in elementary schools. She believes their experience enables them to provide sound advice in a non-judgmental way. Karen described Tapped In (http://tappedin.org/tappedin/) as an online mentoring program in which she has participated. She considered the value of Tapped In as a resource for arranging face-to-face meetings with other participants in Tapped In.

Rationale for multiple usage of Betsy

Although Betsy's data was contained within two of the five transcripts, I believe inclusion of her thoughts within two interviews provided information regarding the contextual nature of interviews. Mishler (1986b) noted that interviewee data can not be separated from the context in which the interview was conducted. Paired interviews were used to provide insight into how participants reacted to each other's comments (Johnson & Turner, 2003). Paired interviews provided each participant with another perspective. During the course of the paired interview, Alison's comments made Betsy reflect about her earlier comments regarding discussion boards. In the paired interview, both Alison and Betsy showed each other features

they discovered while using the BRIDGE. Betsy's data in two settings showed the impact of the collaborative nature of learning in contrast with Betsy learning on her own.

Research Findings

Research Question 1: How do prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs?

Statistical Results for Research Question 1

Questions 21 – 24 of the online survey (Appendix C) provide an overall view of the participant's perspectives regarding online mentoring. Questions 21 and 22 address the participant's previous involvement with formal online mentoring programs while questions 23 and 24 address the participant's willingness to participate in online mentoring programs in the future. Table 4.1 displays the number of Yes and No responses to questions 21 – 24. One participant did not respond to question 21 (Have you ever participated in a formal online mentoring program as a mentor). Two things are important to note from this table. None of the participants stated they had served as an online mentor in the past for a formal online mentoring program. Only one participant stated that she or he had been an online protégé in the past within a formal online mentoring program.

Table 4.2 provides counts of the responses to question 23 (willingness to be an online mentor in the future) in conjunction with question 24 (willingness to be an online protégé in the future) in the form of a contingency table. For instance, 27 participants stated they were willing to be an online mentor and an online protégé in the future. The participants in this study for the most part did not distinguish between being an online mentor or online protégé. In other words,

the majority of participants that stated they were willing to be online mentors also stated they were willing to be online protégés. The majority of the participants that stated they were not willing to be online mentors also stated they were not willing to be online protégés.

Question 25 of the online survey (Appendix C) asked for the status of the participant (pre- or in-service teacher). Tables 4.3 and 4.4 provide the number of pre- and in-service teachers that expressed a willingness to be online mentors and online protégés respectively. For instance, 11 pre-service and 20 in-service teachers stated they were willing to be online mentors. Using the information in Table 4.3, 69% of the pre-service teachers and 65% of the in-service teachers stated they were willing to be online mentors in the future. Using the information in Table 4.4, 81% of the pre-service teachers and 52% of the in-service teachers stated they were willing to be online protégés in the future.

	Number of participants responding YES	Number of participants responding NO
Have you ever participated in a formal online mentoring program as a mentor?	0	47
Have you ever participated in a formal online mentoring program as a protégé?	1	47
Would you be willing to participate in an online mentoring program as a mentor in the future?	32	16
Would you be willing to participate in an online mentoring program as a protégé in the future?	30	18

Table 4.1. Responses regarding Online Mentoring

		Willing to be an online protege	
		Yes	No
Willing to be an online mentor	Yes	27	5
	No	3	13

Table 4.2. Contingency Table of Willingness to be an Online Mentor versus Protégé

Status	Number of participants that were willing to be online mentors	Number of participants that were not willing to be online mentors
Pre-Service Teachers	11	5
In-Service Teachers	20	11

Table 4.3. Willingness to be an Online Mentor by Status

Status	Number of participants that willing to be online proteges	Number of participants that were not willing to be online proteges
Pre-Service Teachers	13	3
In-Service Teachers	16	15

Table 4.4. Willingness to be an Online Protégé by Status

Questions 1 – 3 on the online survey (Appendix C) address the participant's prior mentoring experiences. Responses to these three questions were placed into four groups:

1) Those willing to be online mentors
2) Those not willing to be online mentors
3) Those willing to be online protégés
4) Those not willing to be online protégés

Table 4.5 displays the sample means for the three questions regarding prior mentoring experiences with respect to each of the four groups. For instance, 32 of the online survey participants stated that were willing to be an online mentor in the future. For this group of 32 individuals, they acted as a mentor for someone on average 1.3 times in the past three years. Because this was not a random sample, statistical significance is not calculated.

	Willing to be an online mentor (n = 32)	Not willing to be an online mentor (n = 16)	Willing to be an online protégé (n = 30)	Not willing to be an online protégé (n = 18)
How many times have you been a mentor in the last 3 years?	1.3	3.2	1.3	2.8
How many times have you been a protégé in the last 3 years?	0.9	1.1	0.9	1.0
How would you rate your mentoring relationships? 1 = Poor 2 = Fair 3 = Good 4 = Excellent 5 = Superior	3.5	3.3	3.4	3.5

Table 4.5. Sample Means for Prior Mentoring Relationships

Questions 4 – 20 in the online survey (Appendix C) address the participant's perspectives and prior experiences with computer-mediated communication (CMC). Table 4.6 displays the sample means for each question regarding prior CMC experiences and perspectives grouped according to willingness to be an online mentor and an online protégé. The first question addressed in Table 4.6 was the comfort level the participant felt with using various forms of CMC. Participants entered their perspective on these measures based on an ordinal Likert scale of 1 – 5. For instance, the average comfort level for using e-mail for the 32 individuals that stated they were willing to be an online mentor was 4.5. The labels used in the online survey to represent the Likert scale for comfort level are shown in Table 4.6.

	Willing to be an online mentor (n = 32)	Not willing to be an online mentor (n = 16)	Willing to be an online protégé (n = 30)	Not willing to be an online protégé (n = 18)
Comfort level 1 = Low 2 = Slightly Below Average 3 = Average 4 = Slightly Above Average 5 = High using				
E-mail	4.5	4.3	4.6	4.3
Instant Messaging	3.9	2.8	3.8	3.1
Chat Rooms	2.5	1.7	2.5	1.7
Discussion Boards	3.3	3.1	3.3	3.1
Video Teleconferencing	2.2	1.6	2.0	1.8
Number of hours spent on Internet per day	3.5	2.7	2.8	3.9
Number of e-mails sent per day	8.8	7.3	8.8	7.4
Number of e-mails received per day	14.1	16.6	14.9	14.9
Number of listservs to which the participant belongs	2.3	1.8	2.5	1.6
Number of listserv messages sent per day	3.3	0.9	2.6	2.3
Number of listserv messages received per day	11.6	7.9	11.4	8.7
Number of years participant has used computers	14.9	13.4	15.2	13.1
Number of years participant has used e-mail	8.7	8.1	9.2	7.3
Number of years participant has used instant messaging	4.0	3.3	4.2	3.1
Number of years participant has used chat rooms	1.9	1.6	2.3	1.0
Number of years participant has used discussion boards	2.3	2.1	2.5	1.7
Number of years participant has used video teleconferencing	0.4	0.3	0.4	0.2

Table 4.6. Sample Means for Prior CMC Experiences

Qualitative Results for Research Question 1

Three themes were found with respect to the first research question. First, phrases I coded as "CMC Methods," "Social Exchange," "Online Mentoring Goals," and "CMC Perspectives" revealed some commonality among the interviewees that prior CMC experiences were considered positive when these offered opportunities for learning especially when reciprocal learning occurred. Second, the interviewees expressed similar ideas that instances existed where prior face-to-face mentoring experiences provided a better means of addressing their professional needs in phrases coded as "Mentoring Goals," "Serving as a Mentor," and "Serving as a Protégé." Finally, some of the interviewees noted that their lack of access to face-to-face mentors for certain professional needs may increase their interest in online mentoring in transcript excerpts coded as "Mentor Access," "CMC Perspectives," and "Methods for Online Mentoring."

Theme 1: Individual interest or willingness to participate in online mentoring programs may increase when prior CMC experiences have provided opportunities for learning. The interest in engaging in online mentoring relationships may be particularly strong when the mentor and protégé perceive that CMC will provide opportunities for reciprocal learning.

Betsy described the manner in which she learned about another person on a personal level through CMC interaction. She noted that e-mail has provided an outlet for learning about people she has never met.

> Betsy: Well, one thing I would like to add is I used to think e-mail was pretty impersonal. But I can't think when it started to change. I guess it was in the past year or two when it started to change. I've kept in touch with friends in high school who go to different

universities. So also recently as I said, I'm going to Brazil. The people who are in charge gave me one of the girls who lives down there her e-mail. And we started e-mailing each other, and I feel like I know her already.

Cindy and Fred noted their prior experiences with discussion boards provided opportunities for reflective learning. They mentioned that they thought about the content in new ways or changed their minds during the process of reflective learning.

Interviewer: Describe your experience with discussion boards.

Cindy: She (the instructor of the class) would pose questions on Blackboard and mostly questions to deal. Actually it was dealing with technology and education and how the two worked together. And it was very interesting too. She would ask you to give a thoughtful response to read what the other students had to write. It did serve to spark your interest or spark something else where you'd say well you know I hadn't thought about it like that.

Interviewer: What if somebody new came to you (and asked for mentoring help) via electronic means?

Fred: Yeah. I could do that. I could respond. That was one thing I guess I did like about WebCT (discussion board). Here's what I think about something because our instructor would pose questions or we would have to read something. And post a response to our reading. And once I responded or I could read other people's responses and think, you know I didn't look at it that way. But now that I see what you're saying well that changes how I first thought. And so I would actually you know change my thinking based on what other people had said or even had responded. One time I really screwed

> up. Somebody said you know I don't know that you really understand. I said oh OK, and I went back. Oh yeah, I kind of missed that one, didn't I? I actually changed what I was thinking based on other people's responses. Yeah. I could do that. It was a good experience.

Although Karen stated that mentoring relationships need a quick response to issues from a face-to-face mentor, she described the support of CMC in providing an environment of reflection. This is one example of a series of e-mails she exchanges with her high school mathematics teacher.

> Interviewer: Well, the e-mails you've exchanged with him (her favorite high school math teacher). What types of questions did you ask that didn't demand an immediate response?
>
> Karen: Well, some were like how would I teach this? What do you think? How do you think would be a good way to approach this? Or, one I remember it sounds crazy but I was complaining that my kids were doing really bad on a test and so I sent a copy of the test because they were not doing well. And, he suggested that I upgrade the font. That I make the font larger. Go from 12 point to 14 point. And that just made a big change because it turned out my kids couldn't see. I was in a poor county and not all of them had glasses. They were having a hard time READING the test. That's why they weren't answering the questions very well so it was just little ideas but that was something I didn't need it (snaps fingers) right then. I needed it. It could wait a couple of days…sort of question.

In addition, Betsy, Cindy and Karen also noted the importance of reciprocal learning in which both parties learn from each other. Betsy described the process of reciprocity in learning about another language with a student in Brazil.

> Betsy: And I told her how I'm learning Portuguese. And you know it's kind of hard.
>
> Interviewer: Yeah. It's very difficult to do. Do you do any Portuguese in the e-mails?
>
> Betsy: Yes. I wrote a few sentences in Portuguese. This is my introduction class, and she wrote back today. And corrected me. And then she said you know she would like me to correct her too.

Cindy noted the friendship that may develop between mentors and protégés as they learn from each other.

> Interviewer: Would you see any role reversal where somebody might be your mentor at one time and you might serve as a mentor for them?
>
> Cindy: I would think so because I think that comes with friendship that as you learn more about each other. And everybody has the different experiences in their lives that perhaps at one time you would. And you probably would want to be able to share and help them too.

Karen described the need for the mentor and protégé to learn from one another about a topic in which they shared a common interest.

> Interviewer: In terms of you serving as an online mentor, how would you use the technologies if you were an online mentor?
>
> Karen: As a mentor, I would look for somebody who is trying to learn something either I was teaching or I was doing because I want to learn from them too. It's not just a one-way. The mentor is not just a shoveler and you're just the shovelee.

Theme 2: Individual interest in participating in online mentoring programs may decrease when dealing with issues that are perceived as more amenable to face-to-face interaction.

Karen and Fred described the support that face-to-face mentors can provide in dealing with unexpected or stressful situations. Individual interest in participating in online mentoring programs may decrease when dealing with issues that were handled well in prior face-to-face mentoring relationships. Karen described the support she received from a teacher next door to her class.

> Interviewer: Do you have any informal type mentoring relationships that you assumed?
>
> Karen: …That was how I think teaching should be because you are both equal but then you still have someone to help you. You know what do you do when the kid comes up to you and says I've wet my pants (laughs). You know it's just one of those I think that would never would happen to me in middle school.

Fred described the helpfulness of a face-to-face mentor in dealing with the emotional turmoil of the death of a student.

> Fred: My first year I had a bad day when I had a girl die in class. You know she was killed in a car accident that evening. And I had to come in the next day in the classroom. I didn't know what to do. And had it not been for been for the guy next door to say well don't call her name when you take attendance. Be sure you mark off her name. I hadn't thought of that.

Alison believed that face-to-face interaction might be necessary in some cases to promote a feeling of sincerity in the mentoring relationship.

> Interviewer: How would you see this system (the BRIDGE) comparing to the face-to-face mentoring relationships that you have or developing now?

Alison: I always think face-to-face is better especially like teacher-to-student relationship. Like students will get more if they feel like you're sincere and really want to see them face-to-face.

Theme 3: Availability of face-to-face mentors to address the professional needs of the protégé may impact the willingness to participate in online mentoring programs.

Fred provided a perspective on the manner in which lack of access to mentors in the past impacts perspectives of online mentoring. At the beginning of the interview, I asked Fred to describe some important goals for mentoring relationships. During this exchange, Fred described the feelings of isolation a new teacher feels that leads to high attrition rates of new teachers.

Interviewer: What would you see, say at the end of the year, what outcomes would you see that you would say this was a positive experience versus a negative one?

Fred: Was it a successful year for the person for the mentee? Was I there to provide them the answers they needed? Did I help them survive the year? You know because lots of times that first year is extremely frightening. You know statistics say we lose most of our teachers in the first five years just because they feel alone.

I later asked Fred to recall his own experiences as a new teacher. Fred described the lack of access he had to mentors in his first few years of teaching.

Interviewer: Describe what your professional development was like your first year.

Fred: I think there was no formal professional development. I think education has been real bad about expecting everybody to get it on their own. That we have not traditionally provided support to people in their early years. We tend to, and I know I'm as guilty as the others, we tend to put people in the classroom and say have at it. And provide them

very little moral support other than to say we'll I'm here if you need me but the new people are oftentimes are so overwhelmed that they do not know where to start. So I think mentoring is a very valuable tool that we need to use more often with new people. I think early on many of us we survived just because force of will. And you basically taught yourself.

At the end of the interview, Fred described online mentoring as a "novel idea", but online mentoring may be necessary to address the problem of teacher attrition.

Interviewer: Is there anything that I didn't address that you see being applicable to online mentoring for teachers?

Fred: It's (online mentoring) such a novel idea to me. I guess. (pause) It's just different but I realize again that's what we've come to.

In some cases, teachers were the only individuals at their school in a particular content area. In these instances, CMC may provide an outlet for communicating with one's professional peers. Although Karen teaches at a large elementary school, she is the only Local School Technology Coordinator (LSTC) at the school. She described the value of a listserv in connecting her to other LSTCs in the county.

Interviewer: What would be some important end outcomes or outcomes in general in mentoring relationships for you?

Karen: Really a lot of, just getting ideas, getting just the exchange of ideas. It's really an important outcome and getting different ways to do things because that really. At least in my job we have to work with a lot of work arounds. What happens on a day when this isn't working or this isn't working? Or how are you working around that program. And I guess now thinking about it that way I guess I am being mentored by a whole lot of

people online. We have a listserv, and people ask questions on it and then other people respond to you based on the questions you ask. So, you don't have that one person to go to. You have I think there are 57 elementary schools. I have 56 other people that I can go to and ask a question because I can ask it on the listserv. And then the people they've all been in this job so they can respond this is what we're doing in our school. This is what we're doing in our school and this is how we're trying to deal with it. So, it's really what you can learn.

With respect to the new teaching standards in the state of Georgia, Cindy noted her personal interest in learning more about the standards regarding the integration of mathematics and writing. This discussion emerged during our discussion of the BRIDGE (an online resource for teachers). Although the BRIDGE is not an online mentoring program in the sense of two individuals exchanging e-mails with each other, the Georgia Systemic Teacher Education Program (GSTEP) stated the purpose of the BRIDGE is to facilitate communication between beginning teachers and their mentors (Georgia Systemic Teacher Education Program, 2005). In addition, GSTEP noted the role of technology within the BRIDGE was to provide greater access to mentors for teachers (Georgia Systemic Teacher Education Program, 2003). While displaying the BRIDGE to Cindy on my computer, she noted the challenges she faces in which she seeks further help.

Interviewer: Did you do any searches on language arts type things?

Cindy: No, I did not do any content area searches.

Interviewer: I think there was a fair number when I was searching on math.

Cindy: I would read these two things because they're the standards. And they're (National Council of Teachers of Mathematics) like the official math gurus in the nation.

The Integration of English Language Arts into Math. This is a hard one for me - the big push to be able to write about math. That's tough. So, I would probably look for anything that would help me be able to help the students do that.

Although Karen presently works in a large elementary school located in a metropolitan area, she started her teaching career at a small rural school. Karen stated that smaller schools do not have the ability to support the exchange of new ideas to the extent to which larger schools.

Interviewer: So at ___ (smaller rural school) describe your accessibility to mentors in that environment.

Karen: And in ___ county (small rural county) you may not find out the ideas because the people stay. Here (large county in her present position) there is a lot of transition and it's not because people hate it. It's just because it's so big that you know in ___ county (small rural county) to lose 5 teachers from a school is a big deal. I mean the teachers have been there forever. I mean we had people retire with 30. We had one with 40 years of experience, and she was still working. So, they just lasted forever versus here (larger county in her present position) you have a lot of young ideas. A lot of people going back to school. Those kinds of things. So in a rural area you don't get as much as many new ideas floating around just because the size isn't the same. And you don't have as many people with different ideas or different ways of coping because the size isn't the same.

Interviewer: How would you use the online mentoring programs if you were still at ____ county (small rural school)?

Karen: Well I could see I would use it more to get ideas for my classroom. And to solve not as much management ideas but a lot more idea kind of how do I teach this, how do I present this, those kinds of things. Because in ___ county (small rural school), I may be

> the only algebra teacher. And so I'm the only person teaching this I don't have anybody I can float ideas off of versus and get ideas. So I can see more of a mentor program to help people cope and get ideas and get just mainly ideas and ways of teaching things and new ways to teach things. Because things do get tired and you may be teaching one thing and there may be a much better way or a much more interesting way for your students or a much better way to learn how to teach it. In a more urban school system, you get more of that plus you get more staff development. And in ___ county (large school system in her present position) it's very difficult to get your you know you have to have 10 SDU's (Staff Development Units) to keep your certificate. Here I mean you have to basically ignore the world to not get those 10 SDU's in a rural system it's a whole lot harder. You have to actively go out and find those opportunities.

Research Question 2: What are the affordances offered and constraints posed by various forms of CMC on mentoring relationships for teachers?

Statistical Results for Research Question 2

Questions 4 – 8 of the online survey (Appendix C) address the participant's perspectives using five different forms of CMC (e-mail, instant messaging, chat rooms, electronic discussion boards and video teleconferencing) on a Likert scale from 1 to 5. These questions asked the participant to rate their comfort level, usefulness for communicating with others and willingness to learn about new features for five forms of CMC. Table 4.7 displays the sample means for comfort level, usefulness for communicating with others and willingness to learn about new features for all five forms of CMC. Table 4.7 also provides the labels used for the various values on the Likert scale.

	Comfort Level 1 = Low 2 = Slightly below average 3 = Average 4 = Slightly Above Average 5 = High	Usefulness for Communicating with others 1 = No use 2 = Slightly useful 3 = Moderately useful 4 = Highly useful 5 = Incredibly useful	Willingness to Learn about new features 1 = Not willing 2 = Slightly willing 3 = Moderately willing 4 = Very willing 5 = Extremely willing
E-mail	4.2	4.4	4.3
Instant Messaging	3.5	3.7	3.9
Chat Rooms	2.2	2.3	2.8
Discussion Boards	3.1	3.2	3.5
Video Teleconferencing (e.g., WebCAM)	2.0	3.1	3.5

Table 4.7. Sample means for perspectives regarding various forms of CMC

For the most part, sample means between comfort level, usefulness for communicating with others and willingness to learn about new features are fairly consistent for each form of CMC. In the case of e-mail, the sample means were on the higher end of the Likert scale (above 4) for comfort level, usefulness for communicating with others and willingness to learn about new features. In the case of chat rooms, the sample means were relatively low (below 3) for comfort level, usefulness for communicating with others and willingness to learn about new features. Video teleconferencing was the only exception to this pattern. In the case of video teleconferencing, the mean score for usefulness in communicating with others and willingness to learn about new features was over 1 point higher than mean comfort level. Figure 4.1 provides a histogram that decomposes the full data set for perspectives on video teleconferencing. The numbers across the top of the bars represent the number of participants that responded to that

particular Likert value. Thirty-one of the online survey participants rated their comfort level using video teleconferencing as either low or slightly below average. In contrast, twenty of the online survey participants stated they were either very willing or extremely willing to learn about new features in video teleconferencing. Figures 4.2 through 4.5 provide a similar decomposition in the form of histograms for the online survey participant's perspectives regarding e-mail, instant messaging, chat rooms and discussion boards respectively.

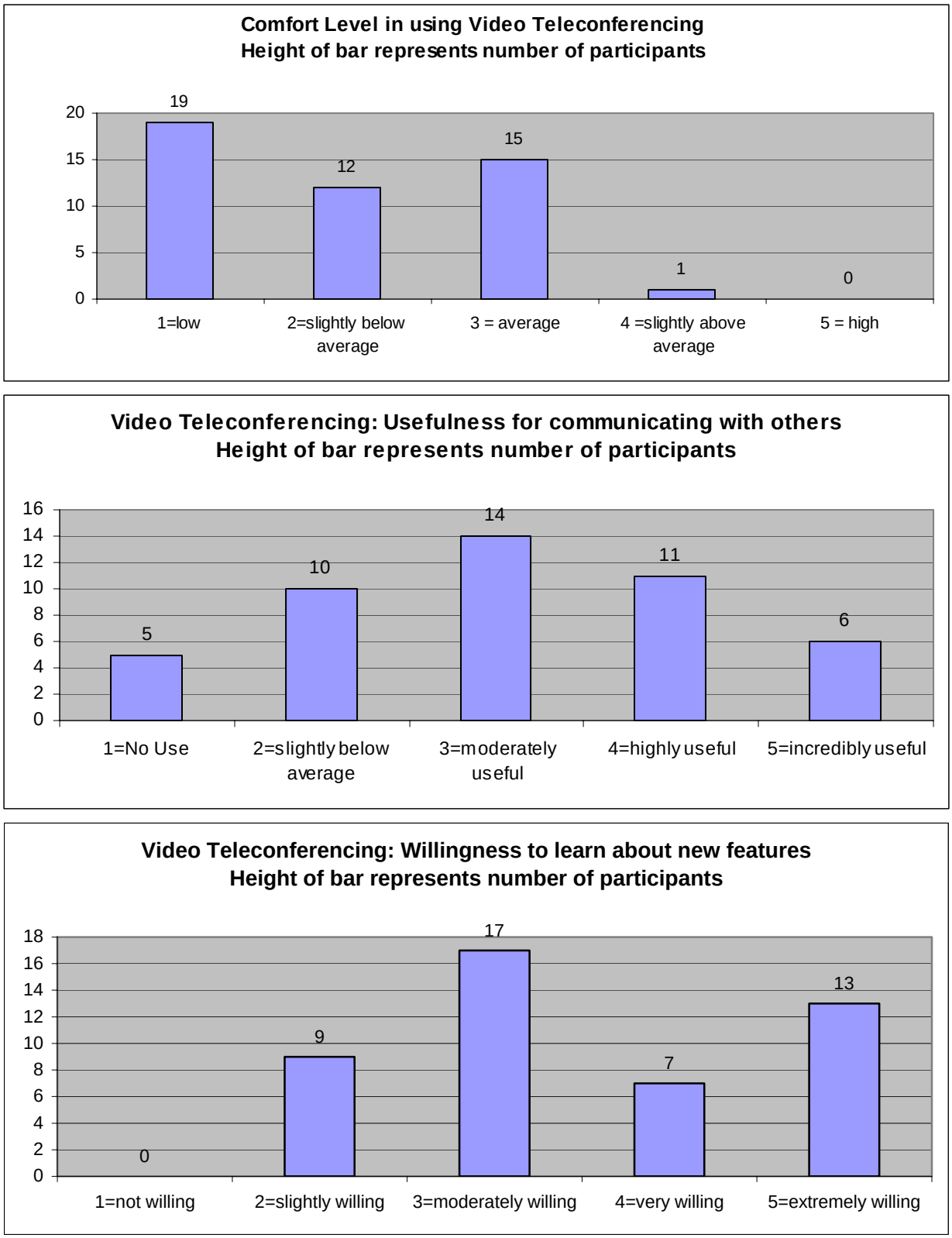

Figure 4.1. Histograms of online survey perspectives regarding video teleconferencing

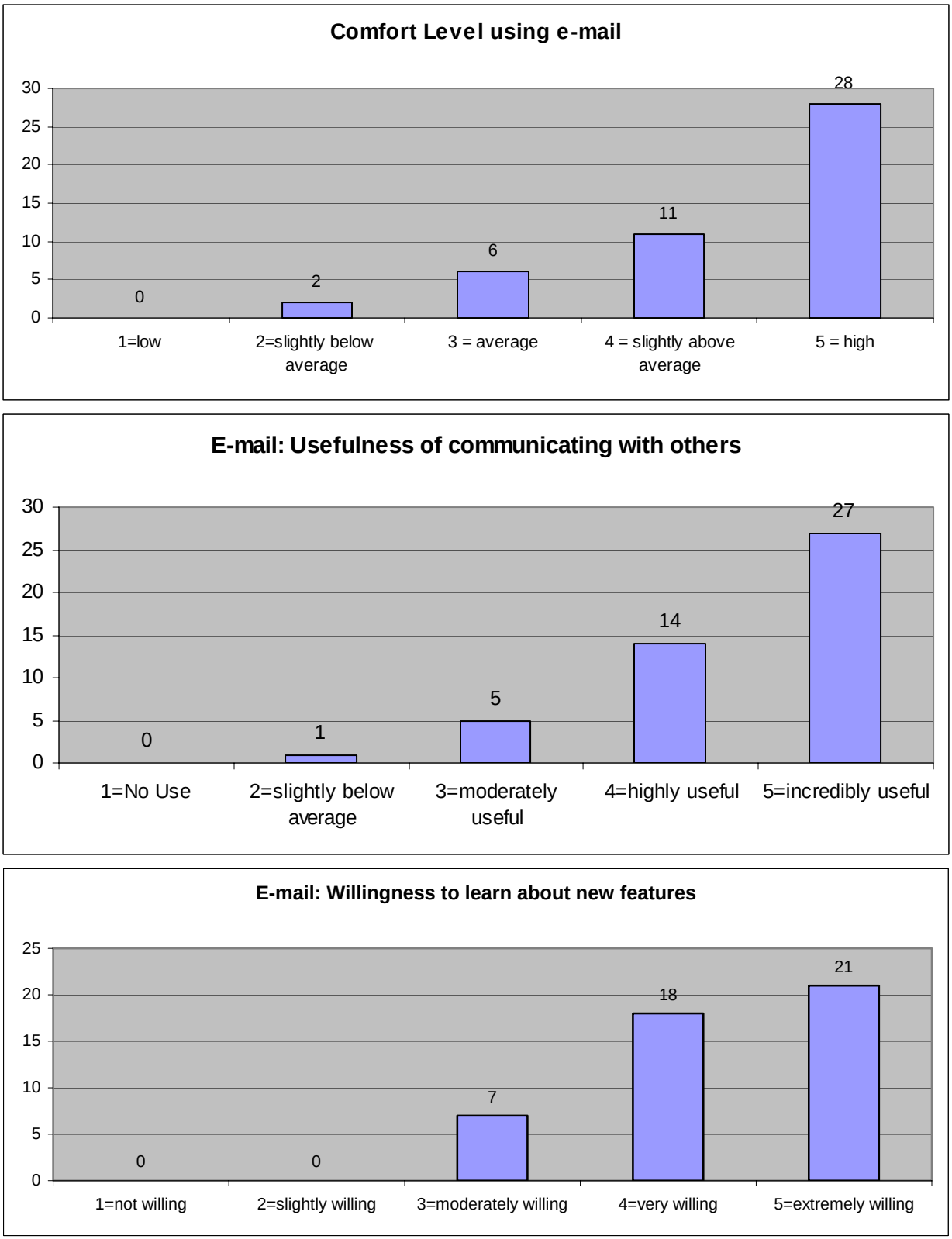

Figure 4.2. Histograms of online survey perspectives regarding e-mail

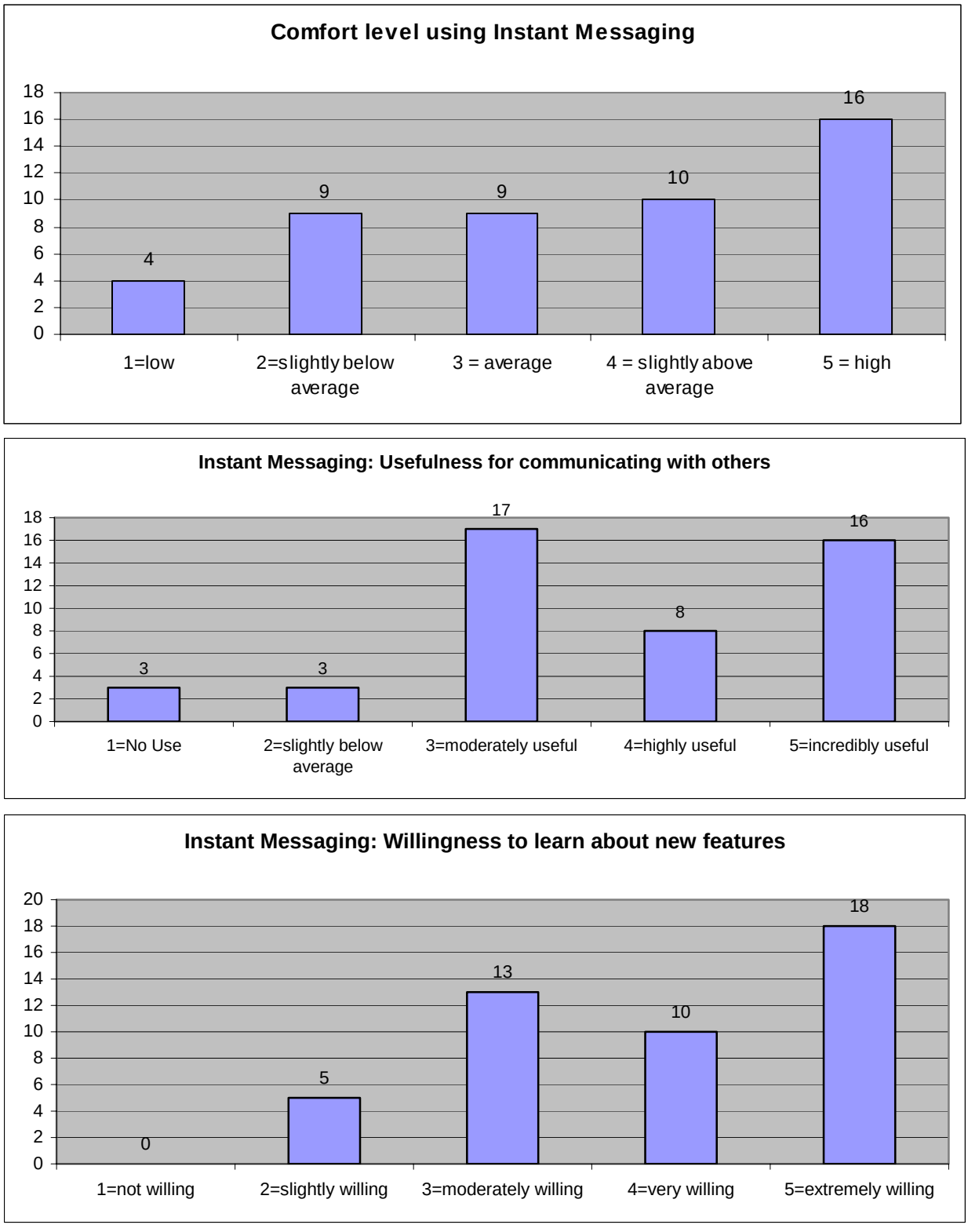

Figure 4.3. Histograms of online survey perspectives regarding instant messaging

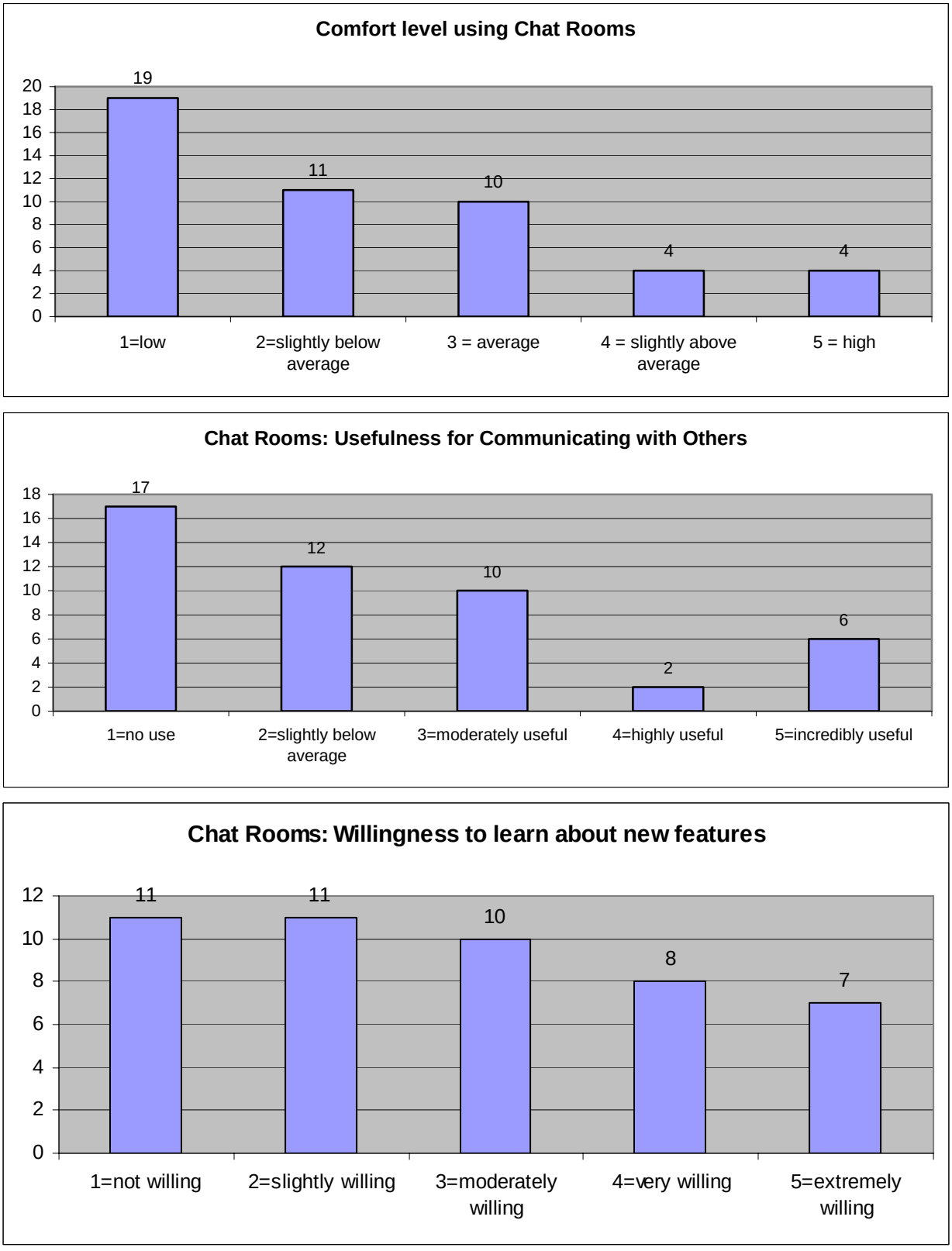

Figure 4.4. Histograms of online survey perspectives regarding chat rooms

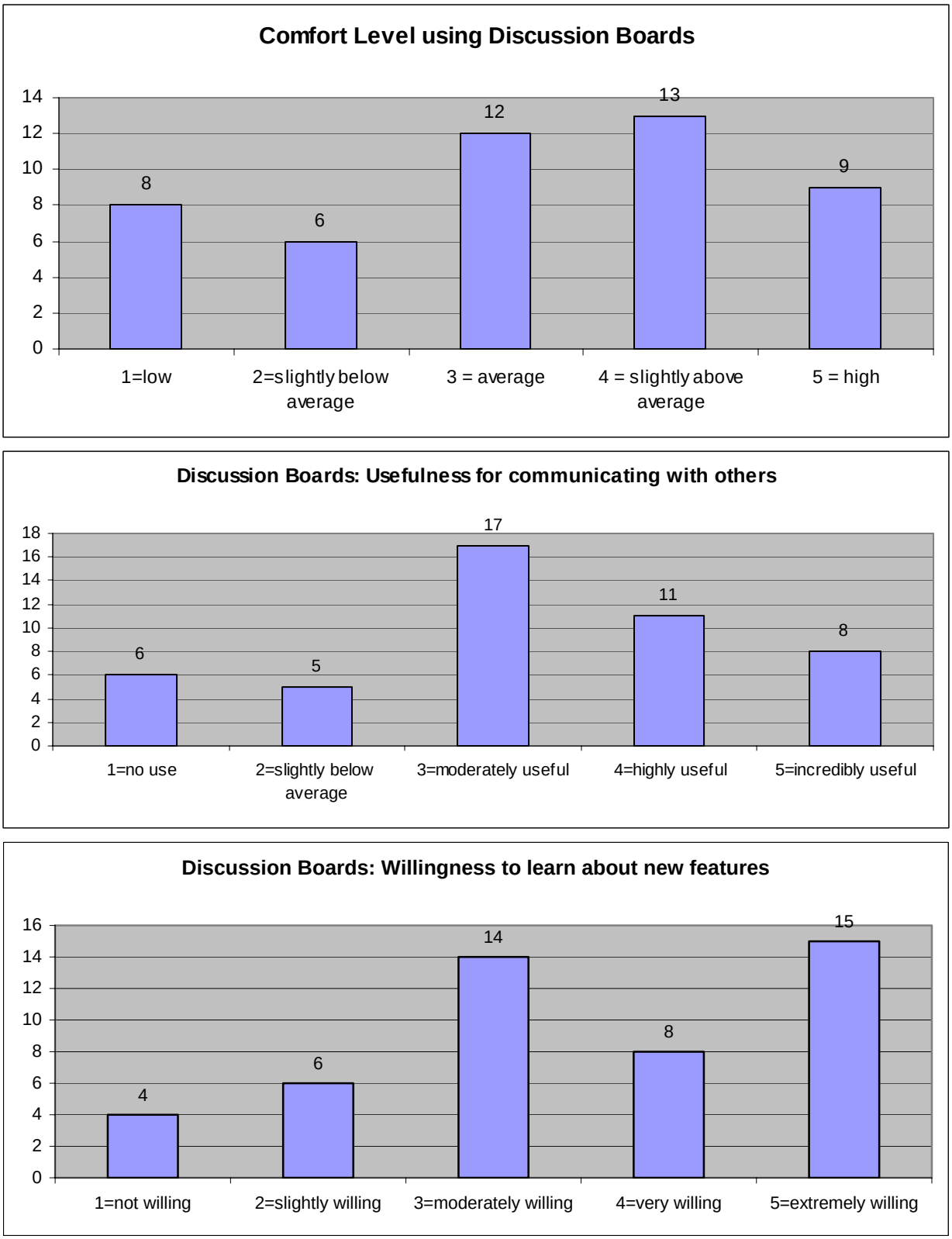

Figure 4.5. Histograms of online survey perspectives of discussion boards

Qualitative Results for Research Question 2

I found seven themes (three affordances and four constraints) during the analysis of my second research question. These themes were developed relative to each form of CMC (e-mail, instant messaging, chat rooms, discussion boards and video teleconferencing) in conjunction with the codes "CMC Social Presence", "CMC Perspectives" and "Mentoring Goals". First, the interviewees noted the lack of social presence within CMC might hinder the dynamics of a mentoring relationship (e.g., can not see facial expressions that indicate lack of understanding). Second, although video teleconferencing might enhance social presence, the interviewees lacked access to this form of technology, and they did not understand how to use it. Third, in contrast, e-mail was the most common form of CMC used by the interviewees. Fourth, some of the interviewees considered instant messaging as a quick way to communicate in a manner similar to a phone conversation. Fifth, three of the interviewees (Betsy, Cindy and Fred) noted the manner in which discussion boards provided an environment for learning through the process of reflection. Sixth, although discussion boards may provide an outlet for reflective learning, improper design of discussion boards (e.g., only one forum to post messages) may hinder the learning process. Finally, some of the interviewees considered chat rooms as environments that were unsafe.

Theme 1 (Constraint): Each of the forms of CMC lacks the social presence of face-to-face communication.

Betsy described her an initial perspectives of e-mail as impersonal.

> Interviewer: Are there any areas that you feel like I didn't cover here that you think are applicable to the online mentoring experiences that we might build for teachers?
>
> Betsy: Well, one thing I would like to add is I used to think e-mail was pretty impersonal.

Cindy noted that e-mail does noted provide the visual cues of face-to-face interaction.

> Interviewer: Would you see using any of those types of technologies in a mentoring relationship?
>
> Cindy: Perhaps if you were only e-mailing back and forth and really never met in person, you wouldn't ever have that visual of who they were.

Alison noted that e-mail may lack a feeling of sincerity.

> Alison: I always think face-to-face is better especially like teacher-to-student relationship. Like students will get more if they feel like you're sincere and really want to see them face-to-face.

Karen described the manner in which video teleconferencing may increase the social presence of the interaction.

> Interviewer: What might be some of the features about video teleconferencing that you might find useful in a mentoring relationship?
>
> Karen: Well, you can get a picture. I mean you can see that person and get a reaction. E-mail, instant messaging and all that you can't hear the tone of voice. So, I might say something, and you don't know me all that well. You have to be much more careful about what you write in an e-mail or in an instant message than you do when you say it. Because you have tone of voice, you have facial. You can say something to somebody, and you can be sarcastic and they know you're being sarcastic versus if you do that in an e-mail. It can be very easily misinterpreted so that's where I could see instant messaging and sometimes where you just want to vent. You don't want it written down. You just much prefer to just say it, and it's gone, and it's over with. Versus having it written down it can come back and bite you when it's written down.

Fred noted the implications of the lack of social presence even in cases where the individuals know each other.

> Fred: However again I tell my wife not to get on it (instant messaging) a lot because I find particularly my daughter tends to say things in typing that she would never say in person. And I get frustrated sometimes. So I just want to reach through the computer and grab her up and slap her a couple of times. And say you don't talk to me that way. She'd never say it, but she types it. And that's the one thing I find maybe in instant messaging we get too informal sometimes and actually type things.

Theme 2 (Constraint – video teleconferencing): Despite the possibilities that video teleconferencing may enhance social presence, lack of access to video teleconferencing equipment is a constraint for using video teleconferencing in online mentoring relationships. Video teleconferencing was the least used form of CMC by the interviewees.

> Interviewer: Are there any constraints that you face in using those technologies (video teleconferencing)?
>
> Cindy: Well I think that the constraint is you know I don't have it, never used it, probably my computer at home wouldn't even support it. I mean. Even money constraints to be able to set yourself up for that situation. I think sometimes time. Just spend the time to do it.

Although Fred had used video teleconferencing in the past, he had to drive to a local college because none of the K-12 schools in his county had video teleconferencing capability.

> Interviewer: What types of technologies would you like to use in communicating with them (online protégés)?

Fred: I participated a couple of times in a distance conference. GSAMS, that's what we've used. Video teleconferencing. I wasn't too impressed with that. It's crazy because two of the teachers were at ___ (a local high school), and I was here. And we were driving to ___ (a town approximately 30 miles away) for the class. We could have gone to ___ (a local college, approximately 10 miles away) and done the same thing. But we went to ____ (college approximately 30 miles away) because one of the teachers, the one doing it, said you'll come up here.

Karen stated that lack of adequate infrastructure (e.g., bandwidth) hinders access to video teleconferencing capability.

Interviewer: Are there any technologies that would you like to use that for whatever reason you don't use?

Karen: Well, you know I think video cam is kind of cool, but I don't use it because it's expensive. Well, it's expensive, it takes up bandwidth, and I don't have a camera that will support it.

During the course of the paired interview, Alison and Betsy stated they had not used video teleconferencing. I asked Alison and Betsy to rate the ease of use and usefulness of communicating with others with several forms of CMC on a scale of 1-5.

Interviewer: And lead me through your thinking process about how you categorized these as you did**.**

Betsy: I put video teleconferencing as neutral because I've never used it before.

Alison: I put the same thing. I've never used it before.

Theme 3 (Affordance – e-mail): E-mail was the most common form of CMC used by the interviewees. In addition, the interviewees considered e-mail very easy to use.

Alison: E-mail and cell phones are my basic modes of communication daily. I'm obsessed with e-mail, and I check it a million times a day.

Interviewer: What types of technology tools do you use to just communicate with people in general?

Fred: Of course, we have become e-mail snobs practically. We rely on e-mail for everything.

Betsy: I communicate with a lot of my professors here through e-mail.

Theme 4 (Affordance – instant messaging): Instant messaging provides a quick way to communicate.

Interviewer: How do you use instant messaging?

Alison: It's (instant messaging) almost like a cell phone but I mean there's no delay like e-mail is. So I feel like there's a better connection there.

Interviewer: How do you use instant messaging?

Fred: It's just a quick way to stay in contact rather than picking up a phone. That to me is a valuable way I guess to answer questions. And have a quick chat with somebody. I may not have time to pick up a phone and call but at least I can respond to you real quick like and give you an answer. Or well let me think about that, and I'll get back with you.

Interviewer: Are there any other types of technologies that you've used, communication technologies?

Karen: I like instant messaging. And that's a nice way if you plan a time to talk if you are at a distance. And you plan this time to go over something you have that ability to get that instant. E-mail does take time. That's a whole lot faster because even sometimes e-mail has to go out and hit this server and hit this server.

Theme 5 (affordance – discussion boards): The asynchronous nature of discussion boards may provide an environment that promotes reflection.

Betsy: But I do think that discussion boards are somewhat useful because you can say what you want to discuss. And check back to it periodically to see what others have posted as well.

Cindy: She (the instructor of a class using the discussion board on Blackboard) would ask you to give a thoughtful response to read what the other students had to write. And it would. It did serve to spark your interest or spark something else where you'd say well you know I hadn't thought about it like that. Or I hadn't even considered that side of it so it did broaden, give you more things to think about.

Fred: And once I responded (to a WebCT discussion board message) or I could read other people's responses and think, you know I didn't look at it that way. But now that I see what you're saying well that changes how I first thought.

Theme 6 (constraint – discussion boards): Discussion board forums may become too lengthy to adequately comprehend or participants may post useless or no information.

Interviewer: And lead me through your thinking process about how you categorized these as you did**.**

Alison: We've always had web discussion boards on WebCT, and I found it somewhat difficult. They're threaded, the main topic and the subtopics. And they confuse me. I had a test today. We started off with no messages, and they have different categories such as all, main, but they're not branched off any more than that. So every single message goes in the same folder so I have to scan you know through 30 messages and figure out who it's from. And you don't automatically see the message so if they don't title the heading as something, you know I end up reading a message that doesn't pertain to me. Or I don't care about. And it just frustrates me that way because it seems like so much information there. But I went from 0 to 130 messages within one day.

Cindy: Say discussion boards just where like our classrooms you know have posted questions and stuff. Sometimes that's kind of. It's easy just to write some either flip answer, and you don't get an immediate response.

Fred described the possible use of a discussion board to connect members of the standards committee in his county

Interviewer: So with 30 people, how separated are all of you geographically?

Fred: The intent again is to a bulletin board type arrangement. We haven't done it yet. I don't know how successful that'll be because again it relies on people making postings. And if people don't post, then it doesn't really accomplish a whole lot.

Theme 7 (constraint – chat rooms): The interviewees viewed public chat rooms as unsafe environments. Private chat rooms may decrease safety concerns.

Interviewer: Are there any technologies that you would like to see incorporated within the BRIDGE that you didn't see?

Fred: Possibly chat rooms. I don't know. Maybe again it's my age here. I don't like chat rooms. I have a bad connotation with chat rooms (laughs) so. Get you in trouble or get you a divorce or something. So I stay out of chat rooms. I tell my kids to stay out of chat rooms. You know. That will get you molested or something. I just have not been real big chat proponent.

Interviewer: Were there any technologies that were on the online survey beyond e-mail that you have used, that you'd like to use?

Cindy: I'm not a huge fan of chat rooms. But part of that is because I personally have never gotten in one just for myself. I guess I think of them in a bad connotation for my kids.

During the course of the paired interview, I showed Betsy the chat room available within the BRIDGE program. She implied that private chat rooms may provide a safer haven for interaction.

Betsy: Maybe you could even get your students involved as a safe chat room to talk in.

In addition, Karen held the most favorable views of chat rooms. Her perceptions are based on previous experiences with Tapped In (a private form of chat room interaction for teachers).

Interviewer: How would you see Tapped In addressing important end outcomes in mentoring relationships?

Karen: I can ask questions like I took a class on technology and there were three of us. There was somebody hosting it, and there were two other people that were in the class because it was more like a chat. And she had specific things that she wanted to address

in her chat, but we got to talk about what was going on and ask questions. And she threw out things. And we talked about our schools. And it was much more personal.

Research Question 3: How does CMC impact the access to mentors for teachers?

Qualitative results for research question 3

One theme was found with respect to the third research question from similar ideas across the interviewees coded in the transcripts as "CMC Perspectives" and "Mentor Access". As each interviewee considered his/her access to face-to-face mentors, they noted professional needs that were not adequately addressed in the local setting. In some cases, they (e.g., Fred and Karen) were the only individuals performing a particular function at their school. During the course of this dialogue, they explained the manner in which CMC either addresses or could address these unmet professional needs.

Theme 1: CMC may provide venues for mentoring relationships in meeting professional needs that are not adequately addressed in the local setting.

This theme is related to the third theme for the first research question. An implicit question within the research question is the present state of access to face-to-face mentors. Can CMC increase the number of potential mentors in a teacher's life?

Betsy described her desire to increase her understanding of multicultural issues in preparing her to be a better teacher. She felt authentic interaction with a person from another country (Brazil) would serve in meeting this goal. Because the individual did not presently attend Betsy's university, e-mail provided a medium for Betsy and the student from Brazil to interact.

Interviewer: Have there been any other learning outcomes that you've gotten from that relationship?

Betsy: I learned a lot about their culture you know. They would explain things to me, what they like to do on the weekends and. Today the girl from Brazil she was writing how you know it's interesting how we say our month first before the day. And they say the date first.

Interviewer: Do you see any impact that (e-mail interaction with student from Brazil) might have on your own teaching style as a kindergarten teacher?

Betsy: Absolutely. I mean I think whenever you interact someone from a different culture than yours you learn a great deal. Just learn to be more open-minded and accepting.

Teachers faced challenges in their professional development when they were the only individuals at their school teaching a particular content area. In these instances, CMC may provide ways of communicating with one's professional peers. Fred described his personal struggle with the new teaching standards in chemistry. This struggle is particularly challenging because he is the only chemistry teacher at his high school.

Interviewer: What are some particular areas that you're grappling with right now?

Fred: Right now we're in the midst of the great unpacking of the Georgia Performance Standards, and I'm trying desperately to find some help there. We're right now as I jokingly call it unpacking the standards. What do the standards mean for the teacher in the classroom? And my immediate thought was well I thought that was what the Quality Core Curriculum was. It was going to outline for me exactly what I was supposed to teach in the classroom. I have a copy of the QCC's, and I have a copy of the Georgia Performance Standards. And in chemistry, there is like, I don't, I can't give you an exact number off the top of my head. But there's like 30 QCC's. I never got them all covered

> just because I never had time. Well now we've got performance standards and in content in science in chemistry there's like 7 performance standards. And I've got to dovetail this with that. And I can't figure out what are they telling me I don't have. I mean one of the performance standards literally says I no longer have to teach the gas laws. Literally it's in there in black and white. I do not have to teach the gas laws. And my immediate response is yes and when I send a student to ___ (a local college) into ___'s (a chemistry professor at the local college) classroom and he starts. He sees that student has had chemistry with Fred. He's going to know that this kid already knows about gas laws because Fred taught him. So my standards are different than what they say their standards are. And so I'm having a real hard time trying to figure out what I'm supposed to teach.

Fred stated that he believes the standards will no longer prepare students for college-level chemistry. I later asked Fred about how someone might help with this and other teaching crises he is facing.

> Interviewer: What types of individuals, if they were available, would be most useful in helping you through this experience?
>
> Fred: People that have been there, done that. Possibly just a good general chemistry teacher, college level chemistry teacher that could provide me some one-on-one instruction on review stuff.

Cindy also described the possibilities CMC in earlier transcript excerpts (research question 1, theme 3) could offer in providing access to ideas regarding the teaching standards.

In addition, earlier transcript excerpts from Karen described the mentoring possibilities of CMC in two settings. First, she believed that online mentoring might improve access to mentors

in rural schools. Because these teachers are often the only subject matter experts at the school, CMC might provide an outlet for mentoring relationships with other content experts from other schools. Although Karen presently works at a large metropolitan school, she is the only Local School Technology Coordinator (LSTC) at the school. She described the value of a listserv in connecting her to LSTC's from other schools.

Summary of results

Three research questions were explored during the course of my dissertation study. From the online survey, quantitative results were presented for the first two research questions. Data collected from six interviews were the basis of qualitative data in addressing the three research questions. Themes were offered from the qualitative data on the basis of at least three participants describing a similar idea with respect to a particular research question.

The first research question investigated the relationship between prior mentoring and CMC experiences and willingness to participate in online mentoring relationships. From the quantitative data, the participants did not differentiate for the most part between willingness to be an online mentor versus an online protégé. Three themes emerged from the qualitative data. First, individual interest or willingness to participate in online mentoring programs may increase when prior CMC experiences have provided opportunities for learning. The interviewees described prior CMC experiences that provided opportunities for learning as positive ones. Second, individual interest in participating in online mentoring programs may decrease when dealing with issues that are perceived as more amenable to face-to-face interaction. Some of the interviewees described the value of face-to-face mentors in dealing with stressful or unexpected events. Finally, availability of face-to-face mentors to address the professional needs of the

protégé may impact the willingness to participate in online mentoring programs. Individual interest in online mentoring may increase when the individual does not have a face-to-face mentor to address a particular professional need.

The second research question sought a description of the affordances and constraints that various forms of CMC bring to mentoring relationships. The quantitative displayed an interesting trend regarding e-mail and video teleconferencing. E-mail had the highest mean score for all three Likert-scale measures of the online survey. Although the average scores for the Likert-scale measures were relatively consistent for most of the forms of CMC explored in the online survey, video teleconferencing was an exception. Although video teleconferencing had the lowest mean score for the participant's comfort level in using, the mean score for the participant's willingness to learn about new features in video teleconferencing was much higher.

Three themes were present in the qualitative data regarding the affordances that CMC brings to mentoring relationships. First, e-mail was the most common form of CMC used by the interviewees. In addition, the interviewees considered e-mail very easy to use. Second, instant messaging provides a quick way to communicate. Some of the interviewees stated that instant messaging is similar in some ways to a phone conversation. Finally, the asynchronous nature of discussion boards may provide an environment that promotes reflection.

Four themes were described in the qualitative data with respect to the constraints CMC poses to mentoring relationships. First, each of the forms of CMC lacks the social presence of face-to-face communication. Some of the interviewees stated that technologies like e-mail lack useful information like the tone of voice of the sender. Two of the interviewees thought video teleconferencing may offer levels of social presence comparable to face-to-face interaction. Second, despite the possibilities that video teleconferencing may enhance social presence, lack of

access to video teleconferencing equipment is a constraint for using video teleconferencing in online mentoring relationships. In addition, most of the interviewees had never used video teleconferencing. Third, discussion board forums may become too lengthy to adequately comprehend or participants may post useless or no information. Despite the possibility of discussion boards in promoting reflection, a sound design (i.e., forums grouped by topic) of the discussion board is needed. Finally, the interviewees viewed public chat rooms as unsafe environments.

The last research question addressed the impact CMC has on access to mentors. The results of this research question were related to some of the results that emerged from the first research question. For instance, lack of access to face-to-face mentors for a particular professional need seemed to enhance the interest in obtaining online mentors. In other words, the qualitative data seemed to indicate a relationship existed between access to mentors and willingness to participate in online mentoring relationships. Only one theme emerged with respect to the last research question: CMC may provide venues for mentoring relationships in meeting professional needs that are not adequately addressed in the local setting. Some of the interviewees described instances in which no local support exists for a particular professional need (e.g., learning more about the chemistry standards). In this instance, CMC offers the only means for connecting these individuals to knowledgeable others in the same interest area.

Looking ahead: Chapter 5

In this chapter, I provided the quantitative and qualitative results regarding the three research questions to my dissertation study.

1) How do prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs?
2) What are the affordances offered and constraints posed by various forms of CMC on mentoring relationships for teachers?
3) How does CMC impact the access to mentors for teachers?

In chapter 5, I describe these results in a manuscript I plan to submit to the Journal of Research on Technology in Education (JRTE). Chapter 5 also includes relevant sections of my literature review in chapter 2 (telecommunication in teacher induction and descriptions of social exchange and social presence theory that guided my dissertation study). In addition, chapter 5 will include portions of chapter 3 (methodology, rationale for methodological choices and limitations of my dissertation study).

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CHAPTER 5

CONCLUSIONS

Introduction

Two important issues impact the process of inducting new teachers into the profession. First, statistics regarding the high rate of attrition of new teachers are alarming. Statistics on this matter range from 30 to 50% of new teachers will leave the profession within the first five years of teaching (Abbott, 2004; Dove, 2004; McGlamery & Edick, 2004). Abbott (2004) noted the sense of isolation new teachers feel is one source of the problem for the high attrition rates of new teachers. In a study conducted by Millinger (2004), new teachers attributed their sense of isolation to the lack of support they felt they received from their administration and colleagues. Abbott (2004) described the need for providing emotional support to new teachers in helping them through feelings of isolation.

Several studies have described the value of mentors in providing emotional support to new teachers. Millinger (2004) stated that mentors can share stories regarding their own trials and struggles. These stories will help new teachers understand that trials are common to all teachers, but these trials are survivable. Music educators face unique challenges including finding musical equipment and teaching a wide range of grade levels. Because of these unique challenges, Haack and Smith (2000) described the need for mentors of new music teachers that can empathize with their unique situation. Some of the new teachers in a study conducted by McMann and Johannessen (2004) felt the heavy workload left them feeling depressed. Emotional support from mentors was valuable in helping these new teachers deal with depression.

The second issue of concern within teacher induction programs is the need to help new teachers learn to teach. Wang and Odell (2002) believed the focus on providing emotional support in many teacher mentoring programs is at the expense of helping new teachers learn to

teach according to standards-based reform. Perceptions regarding the poor academic performance of American students relative to students of other nations compound the need for mentoring support on learning to teach in their view. Krull (2005) stated that a need exists for mentors to help new teachers understand the link between educational theory and practice. New teachers often perceive a gap between the theories they see while in their teacher educational programs versus the practical issues they face as a new teacher.

The studies discussed to this point on mentoring primarily involve face-to-face mentoring, but mentoring relationships can occur when the mentor and protégé are physically separated from one another. Computer-mediated communication (CMC) tools like e-mail provide a means in which mentors and protégés can communicate with one another when separated by distance. Several terms are used for describing the use of CMC in mentoring relationships including online mentoring, telementoring or e-mentoring. O'Neill, Wagner and Gomez (1996) defined online mentoring as the "use of e-mail or computer conferencing systems to support a mentoring relationship when a face-to-face relationship would be impractical" (p. 39).

Although online mentoring is a relatively new, it has grown in popularity in recent years (Ensher, Heun, & Blanchard, 2003; O'Neill & Harris, 2004). Despite the growth in the applications of online mentoring, further research in the area of online mentoring is still needed. The present state of affairs regarding online mentoring research suggests "while online mentoring is thriving, little is known about the success and unique challenges of this phenomenon" (Ensher et al., 2003, p. 265). The purpose of this chapter is to address three research questions regarding the role of online mentoring for the professional development of teachers.

1) How do prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs?
2) What are the affordances offered and constraints posed by various forms of CMC on mentoring relationships for teachers?
3) How does CMC impact the access to mentors for teachers?

Theoretical frameworks

Social exchange theory

Social exchange theory states that both parties (mentor and protégé) must benefit from the mentoring relationship in order for the relationship to last (Johnson-Bailey & Cervero, 2004). Jacobi (1991) described social exchange in mentoring relationships as "The mentor as well as the protégé derives benefits from the relationship, and these benefits may be either emotional or tangible" (p. 513). Within the teaching community, the literature often described reciprocity in terms of the mentor and protégé's learning experience. Schrum, Skeele, and Grant (2002-2003) observed reciprocal learning between in-service teachers and the pre-service teachers that were mentoring them. The pre-service teachers acted as mentors by helping the in-service teachers learn how to integrate technology into the classroom. The pre-service teachers learned about the nuances of technology integration by working in the actual school setting of the in-service teacher. Abbott (2004) noted that reciprocal learning often occurs in mentoring relationships through the exposure to new ideas.

Sanchez and Harris (1996) illustrated the idea of social exchange within the Electronic Emissary, an online mentoring program between K-12 students, teachers and subject matter

experts. Their article described the nature of social exchange between Janna (a nine-year student wishing to learn more about King Arthur) and Dr. Eisner (a retired English professor). Janna benefited from the relationship by learning more about King Arthur, a subject not taught at her school. Dr. Eisner benefited by exploring areas of literature that he had ignored for a long time.

Social presence theory

Short, Williams and Christie (1976) defined social presence as "the degree of salience of the other person in the interaction and the consequence salience of interpersonal relationships" (p. 65). Harms (2005) noted that face-to-face interaction is considered the baseline or "gold standard" (p. 8) for measuring social presence. Because face-to-face communication carries visual information (body language) and audio information (tone of voice), face-to-face communication is considered the most media rich of any form of communication.

As noted by Short et al. (1976), social presence measures the consequences of the perceived salience of physical and emotional characteristics of CMC interaction. "Flaming," a hacker term to denote insulting comments or talking endlessly about uninteresting topics, is a negative ramification from social presence. Sproull and Kiesler (1986) researched the incidence of flaming in a business setting that had started to use an e-mail system. Participants stated they were flamed on average 33 times per week in the e-mail system versus 4 times per week in face-to-face communication. Singer (2005) was surprised when issues of flaming occurred during the course of her study. The flaming persisted over a lengthy period of time despite her attempts to appease the situation. The issue started when one pre-service teacher expressed concerns about stopping a fight between two students at her school. Although the initial replies she received offered emotional support, two other pre-service teachers eventually became engaged in a very heated debate comparing the violence of men versus women.

Power

Mentors often hold positions of power within the organizations in which they work (Hansman, 2002). The impact of the power that a mentor has on the professional development of a protégé is a consideration of research on power. Does the mentor use his or her power to stifle or enhance the professional development of the protégé? In some instances, protégés are reluctant to approach potential face-to-face mentors with problems they are facing. This reluctance stems in part from the desire of not appearing "dumb" to those in power (e.g., school administrators) over their performance review (Abbott, 2004). Research (Abbott, 2004; Merseth, 1991) suggests that CMC may provide an environment in which beginning teachers can discuss issues in a much more candid way than they could in their local work settings. The beginning teachers in these studies felt CMC provided an environment in which mentors could help in a non-judgmental way.

Trust is an important element in mentoring relationships (Johnson-Bailey & Cervero, 2004). When mentors misuse their power, protégés find it difficult to trust other mentors in the future (Holland & Eisenhart, 1990; Johnson-Bailey & Cervero, 2004). Johnson-Bailey and Cervero (2004) described the difficulties black women have in trusting white male mentors due to previous negative racial experiences. Holland and Eisenhart (1990) found some women in their study were distrustful of male mentors in general due to previous experiences of sexual harassment from male mentors.

Teacher induction and telecommunications

As described earlier, two important goals face the process of teacher induction. These two goals govern both the quantity and the quality of teachers. First, teacher induction should

provide emotional support in addressing the high attrition rate of beginning teachers. Second, teacher induction should help beginning teachers learn how to teach. Wang and Odell (2002) suggested that these two goals of teacher induction through mentoring are sometimes at odds with one another.

Several studies (Abbott, 2004; Merseth, 1991; Singer, 2005) have addressed the role of CMC in teacher induction. The University of Texas developed Welcoming Interns and Novices with Guidance and Support (WINGS). The WINGS program allows new teachers to communicate via e-mail with experienced teachers at other schools. Abbott (2004) researched the impact of WINGS by conducting interviews and reviewing e-mail logs of 10 online proteges in the WINGS program. Many of the participants in the study felt WINGS provided them with an outlet for receiving emotional support. Because their online mentor had no connection to the online protégé's performance/appraisal, the online protégé felt he or she could receive advice in a non-judgmental setting. Abbott (2004) also noted that facilitation by WINGS' personnel was needed to prevent the dialogue from faltering between online mentors and protégés.

Merseth (1991) made similar findings regarding the possibilities of CMC in providing emotional support to beginning teachers from mentors in non-judgmental ways. Her work involved the study of the Beginning Teacher Computer Network (BTCN) at Harvard University. The BTCN connected thirty-eight graduates of three specific teacher education programs to faculty members at Harvard University via e-mail and discussion boards. Because the BTCN did not involve members from the participant's job setting, many of the participants felt they could discuss issues of concern to them in a much more open way.

Singer (2005) researched the impact of a listserv on a pre-service teachers' practicum experience. Her data included 3,149 listserv messages between 83 student teachers and 10

university supervisors. Because these teachers were going through the same experience, many of the participants felt the listserv provided an outlet for empathy and emotional support from their peers. The participants in the study often expressed similar stresses they were facing such as many of the pre-service teachers described their misgivings about their ability to be a teacher on the listserv.

Data collection and analysis

An online survey was used in the initial phase of the study to collect preliminary information with respect to research question 1 and recruit pre- and in-service teachers for the second phase of the study (interviews). The impetus in developing research question 1 was based on a proposition of Ensher et al. (2003) that prior CMC experiences and interest in mentoring would be significant indicators of interest in online mentoring programs. The appropriateness of the questions within the survey in addressing my first research question was discussed with the lead author of the article as well as other researchers in online mentoring prior to releasing the survey. The online survey collected information regarding the participant's prior mentoring experiences (i.e., rate your prior mentoring relationships on a scale of 1-5), the participant's perspectives of using various forms of computer-mediated communication (CMC) (i.e, rate your comfort level on a scale of 1-5 for using instant messaging) and their willingness to participate in online mentoring relationships. Because definitions of mentoring vary widely (Jacobi, 1991), I defined a mentoring relationship within the survey as a relationship between two individuals for the purposes of professional development that lasts at least 3 months.

The address to the online survey was distributed to various listservs within the College of Education at the University of Georgia of which I was a member as well as to undergraduate and

graduate education classes taught by professors that I knew. No demographic information was collected from the online survey participants aside from their teaching status (pre- or in-service teacher). The online survey was made available for a period of two months and obtained 48 participants (16 pre-service teachers, 31 in-service teachers and 1 individual did not specify his/her status).

The online survey also advertised that I planned to conduct tape-recorded interviews with pre- and in-service teachers. I conducted a purposeful sample for individuals that expressed an interest in participating in an interview that meet my criteria that they were a pre- or in-service teacher in the state of Georgia. The interviews lasted approximately one hour and were subsequently transcribed. Pseudonyms were used for the interviewees in order to protect their confidentiality.

Five individuals (three pre-service and two in-service teachers) participated in some form of an interview (one individual, Betsy, participated in both an individual interview and a paired interview). Alison and Betsy participated in a paired interview and are both sophomores desiring to teach high school English and kindergarten respectively. Although Cindy started her undergraduate program in the 1980's, she was in her last semester of her undergraduate studies in pursuit of her goal to teach language arts and mathematics in middle school. Fred has taught chemistry and physics at the same high school for the last 29 years. Although Karen has worked as the Local School Technology Coordinator (LSTC) for the past three years, she taught mathematics and language arts in middle and elementary school for nine years before working as an LSTC. The qualitative data consisted of five transcripts: one from the paired interview with Alison and Betsy and one each for the individual interviews with Betsy, Cindy, Fred and Karen.

The transcripts were analyzed using an open-coding process (Strauss & Corbin, 1994) where phrases or paragraphs were coded according to the main idea within that portion of the data. After the coding process was complete, the codes and the phrases from the transcripts for that code were placed within the appropriate research question for further analysis. For instance, one of the codes (social presence) described a facet of the affordances and constraints various forms of CMC bring to mentoring relationships (research question 2). Cross-case analysis (Ryan & Bernard, 2000) was used to find themes in cases where three or more of the interviewees expressed a similar idea relative to a particular question.

Limitations of the study

Because several limitations existed with respect to the online survey, the online survey was only used to help in elaborating upon the qualitative analysis of the interviews (Teddlie & Tashakkori, 2003). Although the address of the online survey was only shared with a select group of individuals and could not be "Googled," ® no mechanism existed to prevent individuals from entering data into the survey more than once or from preventing non-teachers from participating in the online survey. Because a convenience, rather than a random sample, was taken for the online survey, I did not attempt to draw statistical conclusions. In addition, the online survey did not capture the manner in which participant's perspectives regarding online mentoring may change over time (Lynch, 2003).

Despite these limitations, the quantitative data did offer some interesting trends that were explored further during the interview process. Although the online survey participants rated their comfort level using video conferencing on average very low (M = 2.0 on a scale of 1-5), the average score regarding the participant's willingness to learn more about video teleconferencing

(M = 3.5) changed much more so than any of the other forms of CMC. For this reason, I incorporated questions into the interview process that explored the participant's perspectives and experiences with video teleconferencing. In addition, the online survey participants did not distinguish between willingness to be an online mentor versus being an online protégé. In other words, the majority of the participants that stated they were willing to be online mentors also were willing to be online protégés and those that stated they were not willing to be online mentors were also not willing to be online protégés. Questions were asked during the interview regarding expectations of being an online mentor versus protégé.

Certain limitations existed with respect to the collection of qualitative data through the interviews. Because Betsy participated in an individual as well as a paired interview, her data were contained in two of the five transcripts and thus her perspectives may be overemphasized. The topic of the interviews was not on a specific online mentoring program, but rather the interviewees only offered their perspectives regarding the possibilities of CMC in terms of their mentoring relationships. The interviewees did not participate in the same online mentoring program in order to compare the differences in perspectives regarding online mentoring.

Results of the study

Three themes were found with respect to the first research question. First, some commonality existed among the interviewees that prior CMC experiences were considered positive when they offered opportunities for learning especially when reciprocal learning occurred. Second, the interviewees expressed similar ideas that instances existed where prior face-to-face mentoring experiences provided a better means of addressing their professional

needs. Finally, some of the interviewees noted that their lack of access to face-to-face mentors for certain professional needs may increase their interest in online mentoring.

Research Question 1: How do prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs?

Theme 1: Individual interest or willingness to participate in online mentoring programs may increase when prior CMC experiences have provided opportunities for learning. The interest in engaging in online mentoring relationships may be particularly strong when the mentor and protégé perceive that CMC will provide opportunities for reciprocal learning.

Betsy described the manner in which she learned about another person on a personal level through CMC interaction. Betsy recently joined an exchange program between her university and a university in Brazil, and she noted the value of e-mail prior to meeting a student from Brazil face-to-face.

> Betsy: I'm going to Brazil. The people who are in charge gave me one of the girls who lives down there her e-mail. And we started e-mailing each other, and I feel like I know her already.

While teaching mathematics, Karen formed an informal online mentoring relationship with her former high school mathematics teacher. During the interview, she provided one example of an e-mail exchange that provided opportunities for reflection and learning about her teaching practices.

> Interviewer: What types of questions did you ask him that did not demand an immediate response?

> Karen: One I remember it sounds crazy but I was complaining that my kids were doing really bad on a test and so I sent a copy of the test because they were not doing well. And, he suggested that I upgrade the font. And that just made a big change because it turned out my kids couldn't see. It was just little ideas but that was something I didn't need it (snaps fingers) right then.

Cindy and Karen noted the importance of reciprocity between the mentor and protégé and terms of learning.

> Cindy: And everybody has the different experiences in their lives. And you (the protégé) probably would want to be able to share and help them (the mentor) too.
>
> Karen: As a mentor, I would look for somebody who is trying to learn something either I was teaching or I was doing because I want to learn from them too.

Betsy provided an example of reciprocal learning within the context of CMC while discussing her involvement with the student from Brazil.

> Betsy: And I told her how I'm learning Portuguese. And you know it's kind of hard.
>
> Interviewer: Yeah. It's very difficult to do. Do you do any Portuguese in the e-mails?
>
> Betsy: Yes. I wrote a few sentences in Portuguese. This is my introduction class, and she wrote back today and corrected me. And then she said you know she would like me to correct her too.

Theme 2: Individual interest in participating in online mentoring programs may decrease when dealing with issues that are perceived as more amenable to face-to-face interaction.

Karen and Fred described the support that face-to-face mentors can provide in dealing with unexpected or stressful situations. They noted the manner in which face-to-face mentors helped them address personal challenges in their induction years of teaching. Fred described the

helpfulness of a face-to-face mentor in dealing with the emotional turmoil of the death of a student.

> Fred: My first year I had a bad day when I had a girl die in class. You know she was killed in a car accident that evening. And I had to come in the next day in the classroom. I didn't know what to do. And had it not been for been for the guy next door to say well don't call her name when you take attendance. Be sure you mark off her name. I hadn't thought of that.

Alison stated that CMC lacks the "sincerity" that is often needed during mentoring and teaching.

> Alison: I always think face-to-face is better especially like teacher-to-student relationship. Like students will get more if they feel like you're sincere and really want to see them face-to-face.

Theme 3: Availability of face-to-face mentors to address the professional needs of the protégé may impact the willingness to participate in online mentoring programs.

Fred provided a perspective regarding the impact lack of access to mentors in the past might have on the views of online mentoring. Isolation beginning teachers feel which leads to high attrition was a motivating factor for Fred's interest in mentoring.

> Fred: You know statistics say we lose most of our teachers in the first five years just because they feel alone.
>
> Interviewer: Describe what your professional development was like your first year.
>
> Fred: I think there was no formal professional development. I think education has been real bad about expecting everybody to get it on their own. That we have not traditionally provided support to people in their early years. And provide them very little moral support. So I think mentoring is a very valuable tool that we need to use more often with

> new people. I think early on many of us we survived just because force of will. And you basically taught yourself.

Fred went on to describe online mentoring as a "novel idea" that may be necessary to address the issues he sees within the teaching profession.

> Fred: It's (online mentoring) such a novel idea to me. I guess. (pause) It's just different but I realize again that's what we've come to.

In some cases, viable face-to-face mentors may not be available because the teacher may be the only individual in the school that performs a particular role. For instance, Karen described the possibilities of online mentoring in her first school (a small rural school).

> Interviewer: How would you use the online mentoring programs if you were still at ____ county (small rural school)?
>
> Karen: I may be the only algebra teacher. And so I'm the only person teaching this I don't have anybody I can float ideas off of versus and get ideas. So I can see more of a mentor program to help people cope and get ideas and get just mainly ideas and ways of teaching things and new ways to teach things.

Research Question 2: What are the affordances offered and constraints posed by various forms of CMC on mentoring relationships for teachers?

I found seven themes (three affordances and four constraints) during the analysis of my second research question. These themes were developed relative to each form of CMC (e-mail, instant messaging, chat rooms, discussion boards and video teleconferencing). First, the interviewees noted the lack of social presence within CMC might hinder the dynamics of a mentoring relationship (e.g., can not see facial expressions that indicate lack of understanding). Second, although video teleconferencing might enhance social presence, the interviewees lacked

access to this form of technology, and they did not understand how to use it. Third, in contrast, e-mail was the most common form of CMC used by the interviewees. Fourth, some of the interviewees considered instant messaging as a quick way to communicate in a manner similar to a phone conversation. Fifth, three of the interviewees (Betsy, Cindy and Fred) noted the manner in which discussion boards provided an environment for learning through the process of reflection. Sixth, although discussion boards may provide an outlet for reflective learning, improper design of discussion boards (e.g., only one forum to post messages) may hinder the learning process. Finally, some of the interviewees considered chat rooms as environments that were unsafe.

Theme 1 (Constraint): Each of the forms of CMC lacks the social presence of face-to-face communication.

All of the interviewees described the implications of social presence within CMC-based relationships. The interviewees noted that e-mail exchange might be considered impersonal (Betsy) or insincere (Alison). Cindy and Karen thought that video teleconferencing might improve upon the lack of visual and tone of voice cues in e-mail. Fred noted the implications of the lack of social presence even in cases where the individuals know each other.

> Fred: However again I tell my wife not to get on it (instant messaging) a lot because I find particularly my daughter tends to say things in typing that she would never say in person. And I get frustrated sometimes. So I just want to reach through the computer and grab her up and slap her a couple of times. And say you don't talk to me that way. She'd never say it, but she types it. And that's the one thing I find maybe in instant messaging we get too informal sometimes and actually type things.

Theme 2 (Constraint – video teleconferencing): Despite the possibilities that video teleconferencing may enhance social presence, lack of access to video teleconferencing equipment is a constraint for using video teleconferencing in online mentoring relationships. Video teleconferencing was the least used form of CMC by the interviewees.

Fred and Karen were the only two interviewees that had any prior experience with video teleconferencing. Fred mentioned his prior video teleconferencing experience involved travel to a college approximately 30 minutes from his school because no video teleconferencing equipment was present in any K-12 school in his county. Cindy expressed the challenges she perceived in using video teleconferencing in mentoring relationships.

> Interviewer: Are there any constraints that you face in using those technologies (video teleconferencing)?
>
> Cindy: Well I think that the constraint is you know I don't have it, never used it, probably my computer at home wouldn't even support it.

Theme 3 (Affordance – e-mail): E-mail was the most common form of CMC used by the interviewees. In addition, the interviewees considered e-mail very easy to use.

> Alison: E-mail and cell phones are my basic modes of communication daily. I'm obsessed with e-mail, and I check it a million times a day.

Theme 4 (Affordance – instant messaging): Instant messaging (America Online) provides a quick way to communicate.

Alison, Fred and Karen described the usefulness of instant messaging for engaging in short interchanges with others in a manner similar to using a telephone.

> Fred: It's just a quick way to stay in contact rather than picking up a phone. That to me is a valuable way I guess to answer questions. And have a quick chat with somebody. I

may not have time to pick up a phone and call but at least I can respond to you real quick like and give you an answer. Or well let me think about that, and I'll get back with you.

Theme 5 (affordance – discussion boards): The asynchronous nature of discussion boards may provide an environment that promotes reflection.

Betsy, Cindy and Fred noted the manner in which discussion boards have provided a means of learning through a process of reflection. Cindy and Fred started that discussion board interaction prompted them to change their mind.

Fred: And once I responded (to a WebCT discussion board message) or I could read other people's responses and think, you know I didn't look at it that way. But now that I see what you're saying well that changes how I first thought.

Theme 6 (constraint – discussion boards): Discussion board forums may become too lengthy to adequately comprehend or participants might post useless or no information.

Alison, Cindy and Fred discussed the limitations of discussion boards including structures that become too unwieldy to comprehend easily or discussion board posts that do not add to the learning process.

Interviewer: And lead me through your thinking process about how you categorized these as you did**.**

Alison: We've always had web discussion boards on WebCT, and I found it somewhat difficult. They're threaded, the main topic and the subtopics. And they confuse me. I had a test today. We started off with no messages, and they have different categories such as all, main, but they're not branched off any more than that. So every single message goes in the same folder so I have to scan you know through 30 messages and figure out who it's from. And you don't automatically see the message so if they don't

> title the heading as something, you know I end up reading a message that doesn't pertain to me. Or I don't care about. And it just frustrates me that way because it seems like so much information there. But I went from 0 to 130 messages within one day.

Theme 7 (constraint – chat rooms): The interviewees viewed public chat rooms as unsafe environments. Private chat rooms may decrease safety concerns.

The interviewee's perspectives regarding chat rooms were the most diverse of any of the forms of CMC we discussed. Cindy and Fred noted the "bad connotation" they have of chat rooms as locations that are unsafe.

> Fred: I don't like chat rooms. I have a bad connotation with chat rooms (laughs) so. Get you in trouble or get you a divorce or something. So I stay out of chat rooms. I tell my kids to stay out of chat rooms. You know. That will get you molested or something. I just have not been real big chat proponent.

Private chat rooms that are used for academic purposes (e.g., chat room within WebCT) may decrease some of the concerns with safety. Karen described her experiences using the chat room feature in Tapped In as positive.

> Interviewer: How would you see Tapped In addressing important end outcomes in mentoring relationships?
>
> Karen: I can ask questions like I took a class on technology and there were three of us. There was somebody hosting it, and there were two other people that were in the class because it was more like a chat. And she had specific things that she wanted to address in her chat, but we got to talk about what was going on and ask questions. And she threw out things. And we talked about our schools. And it was much more personal.

<u>Research Question 3:</u> How does CMC impact the access to mentors for teachers?

One theme was found with respect to the third research question across the interviewees. As each interviewee considered his/her access to face-to-face mentors, they noted professional needs that were not adequately addressed in the local setting. In some cases, they (e.g., Fred and Karen) were the only individuals performing a particular function at their school. During the course of this dialogue, they explained the manner in which CMC either addresses or could address these unmet professional needs.

Theme 1: CMC may provide venues for mentoring relationships in meeting professional needs that are not adequately addressed in the local setting.

Betsy, Cindy, Fred and Karen each provided examples of professional needs that are not addressed by face-to-face mentors. Betsy described the manner in which CMC exchange with a student from Brazil helps to provide a first-hand understanding of another culture. Cindy and Fred noted their interest in help beyond what exists in the local school setting in learning about the implications new teaching standards in the state of Georgia.

> Interviewer: What are some particular areas that you're grappling with right now?
>
> Fred: Right now we're in the midst of the great unpacking of the Georgia Performance Standards, and I'm trying desperately to find some help there.
>
> Interviewer: What types of individuals, if they were available, would be most useful in helping you through this experience?
>
> Fred: People that have been there, done that. Possibly just a good general chemistry teacher, college level chemistry teacher that could provide me some one-on-one instruction on review stuff.

Although Karen presently works at a large metropolitan school, she is the only Local School Technology Coordinator (LSTC) at the school. She described the value of a listserv in connecting her to LSTC's from other schools.

> Interviewer: What would be some important end outcomes or outcomes in general in mentoring relationships for you?
>
> Karen: Just the exchange of ideas. And I guess now thinking about it that way I guess I am being mentored by a whole lot of people online. We have a listserv, and people ask questions on it and then other people respond to you based on the questions you ask. So, you don't have that one person to go to. You have I think there are 57 elementary schools. I have 56 other people that I can go to and ask a question because I can ask it on the listserv.

Discussion

Ensher et al. (2003) proposed "Proteges' and mentors' past experiences with online relationships and interest in mentoring relationships will significantly predict the likelihood of their being willing to become engaged in a mentoring relationship online" (p. 271). Although this proposition is plausible on an intuitive level, the proposition does not define specific past experiences that influence willingness to participate in online mentoring relationships. My first research question explored the manner in which prior experiences teachers have with mentoring and computer-mediated communication (CMC) influence their willingness to participate in online mentoring programs. The goal of this question was to search for specific past experiences with mentoring and CMC-based relationships that influence willingness to participate in online mentoring programs.

Past experiences with CMC that provided the participants with opportunities to learn were described as the most positive. Prior online experiences that provided the participants with an opportunity to reflect on the learning process were useful. Karen developed an online mentoring relationship with her former high school mathematics teacher in which they periodically discussed teaching practice via e-mail. During one of their e-mail exchanges, Karen learned about the nuances of developing a high quality test through a period of reflection for a few days. Reciprocal learning between the mentor and protégé was noted as an important component of mentoring relationships. For instance, Betsy described the manner in which she and a student from Brazil learned reciprocally through e-mail about one another's culture and language.

Most of the material from the interviews regarding prior mentoring relationships focused on face-to-face relationships. Positive prior face-to-face mentoring relationships were described as those that met the interviewee's needs. Fred and Karen described the ability of their mentor in the next room in dealing with unexpected events. Participants seemed less interested in online mentoring relationships when dealing with issues in which their face-to-face mentors could provide assistance. Alison stated that online mentoring is not always amenable to all of the goals of a mentoring relationship. In other instances, the participants encountered some issues that their face-to-face mentors could not address. Lack of access to face-to-face mentors to address particular professional needs may increase interest in online mentoring.

CMC may provide venues for professional development in cases where the teacher has no face-to-face mentors to address particular concerns he or she is facing (research question 3). Fred had no local face-to-face mentors that understood the nuances of teaching Advanced Placement Chemistry. Karen had no face-to-face mentors for dealing with issues she faced as

Local School Technology Coordinator. In addition, Cindy described her need for outside assistance in understanding the implications of the new teaching standards involving mathematics and writing.

The affordances offered and constraints posed by five different forms of CMC (e-mail, instant messaging, chat rooms, discussion boards and video teleconferencing) were explored in the second research question. The online survey provided some interesting trends with respect to e-mail and video teleconferencing that were explored further during the interviews. Although e-mail was ubiquitous in the lives of the interviewees, they noted the lack of social presence in e-mail (e.g., impersonal). In contrast, some of the interviewees felt video teleconferencing may offer a higher degree of social presence.

Four themes were described in the qualitative data with respect to the constraints CMC poses to mentoring relationships. First, each of the forms of CMC was described by the interviewees as lacking the same level of social presence as face-to-face communication. Some of the interviewees stated that technologies like e-mail lack useful information like the tone of voice of the sender. Two of the interviewees thought video teleconferencing may offer levels of social presence comparable to face-to-face interaction. Second, despite the possibilities that video teleconferencing may enhance social presence, lack of access to video teleconferencing equipment is a constraint for using video teleconferencing in online mentoring relationships. In addition, most of the interviewees had never used video teleconferencing. Third, discussion board forums may become too lengthy to adequately comprehend or participants may post useless or no information. Finally, the perspectives of chat rooms were the most diverse in that they were a dichotomy of two distinct views of very favorable versus very unfavorable.

In contrast, three themes were present in the qualitative data regarding the affordances that CMC brings to mentoring relationships. First, e-mail was the most common form and easiest to use form of CMC described by all the interviewees. Second, Alison, Fred and Karen noted that instant messaging provides a quick way to communicate in some ways similar to a phone conversation. Finally, Betsy, Cindy and Fred stated that the asynchronous nature of discussion boards provided them with an environment that promotes reflection.

Implications for research and practice

Reciprocal learning in which the protégé and mentor learn from each other is described within the research literature (Abbott, 2004; Schrum et al., 2002-2003). The interviewees in the study also noted the importance of reciprocal learning, but what are important issues in the teaching community that reciprocal learning should address within online mentoring programs for teachers? As a start, online mentors and protégés should have a similar interest in a topic that they can learn about together. Wang and Odell (2002) made a case for the importance of teacher mentor programs that consider learning to teach in accordance with the standards. Some of the interviewees described the challenges they face with respect to the new teaching standards within the state of Georgia. Online mentoring programs for teachers should consider ways of incorporating reciprocal learning about standards-based teaching. Wang and Odell (2002) suggested that mentoring relationships between teachers should link educational theory to the actual teaching environment. In light of this, one suggestion for online mentoring programs is that online mentors and protégés first develop an understanding of each other's working environment. With this understanding in mind, the online mentor and protégé could learn about the implications of the teaching standards in two different settings.

Developers of online mentoring programs should consider the degree to which face-to-face mentors address the professional needs of beginning teachers. Interviewees described cases where they received support from face-to-face mentors, but instances existed where no face-to-face mentors were available to address particular professional concerns (e.g., they were the only one at the school performing a particular function). Although Smith and Ragan (1999) did not consider instructional design for online mentoring, their suggestions for a learner-centered design are worth consideration. What professional needs do teachers have that are not being met by face-to-face mentors? Design strategies for online mentoring programs that address this question may increase teacher involvement in the program.

Although numerous media comparison studies exist (e.g., de Greef & Ijsselsteijn, 2001; Flanagin, 2005; Harms, 2005), I could not find any studies that compared media within the context of online mentoring. Conrad (2002) stated that the differences that result in findings between studies regarding social presence stem form the fact of the variations in the contexts of the studies. Although a few studies exist that consider listservs (Singer, 2005) and discussion boards (Merseth, 1991) in online mentoring programs, the majority of the research for online mentoring involves e-mail (e.g., Duff, 2000; Ensher et al., 2003; O'Neill & Harris, 2004; Sanchez & Harris, 1996). In a study of schools and universities in the Silicon Valley area, Cuban (2001) found that these schools were not integrating technology into the curriculum in innovative ways. With the diversity of choices that exist for CMC in mentoring relationships, is CMC integrated into online mentoring relationships in ways that provide emotional support while helping new teachers learn to teach according to standards? I believe a research base regarding the affordances and constraints that various forms of CMC bring to online mentoring programs would help in addressing this question.

The omnipresence of e-mail in the lives of the interviewees concurs with results that were conducted in other studies (Baker, 2000-2001; Tassabehji & Vakola, 2005). Baker (2000-2001) estimated that the number of e-mails sent worldwide increased from 20 trillion in 1996 to 78 trillion in 1998 with no end in sight to this trend. The ubiquity of e-mail in modern society most likely explains the widespread use of e-mail in online mentoring programs. Duff (2000) described e-mail is a convenient source of communication that is easy to use within an online mentoring relationship.

Despite the widespread use of e-mail, Flanagin (2005) stated that research has focused on e-mail to the extent that other widely used forms of CMC like instant messaging have been ignored. He provided statistics to support that instant messaging use has grown at a faster rate (33%) than e-mail in 2000-2002. College students are one of the largest demographic groups that use instant messaging regularly. These statistics suggest that instant messaging within online mentoring may appeal to pre-service teachers.

On the other hand, college students have described the need to monitor their instant messaging use due to the fact it distracts them from their schoolwork (Matthews & Schrum, 2003). Although college students have shown their ability to multitask while using instant messaging, this ability degrades when trying to talk to more than four people simultaneously (Flanagin, 2005). Duff (2000) found that professionals like the fact that the asynchronous nature of e-mail provided them with an opportunity to mentor in accordance with their own schedules. The synchronous nature of instant messaging does not provide this same level of flexibility. In addition, Bierema and Hill (2005) stated that differences in the manner in which online mentors and protégés use CMC is one challenge to online mentoring. Mentors that use e-mail frequently become frustrated with protégés that only check their e-mail periodically (Harris,

O'Bryan, & Rotenberg, 1996). If instant messaging is used within an online mentoring relationship, online mentors and protégés should consider the frequency and manner with which they use instant messaging. Online mentoring programs should help in matching mentors and protégés that use instant messaging or any form of CMC in similar ways.

Perspectives regarding chat rooms were the most diverse in my study as well as the research literature. The findings of Ross, Rosser and Stanton (2004) supported the views of Cindy and Fred of chat rooms being locations where cybersex occurs frequently. On the other hand, Whitty's (2002) findings that chat rooms provided an open and supportive environment concurred with the perspective of Karen. Whitty (2002) also found that significant differences in perspectives regarding chat rooms occur with respect to demographic variables. For instance, one of her findings was that men expressed a greater propensity to be dishonest in chat rooms than women.

The interviewees noted that reciprocal learning that took place over the course of time (reflective) was an important element in mentoring relationships, and discussion boards may facilitate this process. Lim and Chaeh (2003) stated "Online discussion boards are increasingly being used in web-based learning environments to facilitate interactions to support the shared construction of knowledge" (p. 34). Wicksom (2003) found that the process of reflection was enhanced when pre-service teachers kept a discussion board journal. On the other hand, discussion boards can become confusing if proper consideration is not given to the design of the discussion board. Price and Chen (2003) recommended that online mentoring programs have several different forums arranged according to topic in order to prevent volumes of posts that do not relate to the interests of the majority of the readers. Wicksom (2003) shared an important lesson that she learned from using discussion boards with her literacy class with pre-service

teachers was not to attempt too many things at once. The goal for designers of discussion boards of online mentoring programs is to provide an environment in which the mentor and protégé can learn reciprocally about open-ended questions and ideas.

Some of the interviewees considered the possibilities of video teleconferencing in terms of enhancing social presence in online mentoring relationships, but research regarding the unique challenges associated with this form of CMC in online mentoring relationships is needed. Although some studies have found video teleconferencing does enhance social presence (de Greef & Ijsselsteijn, 2001; Harms, 2005), these studies did not take place in the context of online mentoring relationships. In addition, these studies often are focused on specific tasks rather than open-ended questions online mentoring relationships may consider (e.g., teaching in accordance with the standards). Two important questions for research on video teleconferencing in online mentoring relationships are:

1) What is the nature of social presence within online mentoring relationships while using video teleconferencing?
2) What are the implications of social presence from video teleconferencing within online mentoring relationships?

Face-to-face communication possesses the highest level of social presence (Harms, 2005), and therefore face-to-face interaction is generally considered the most desirable form of interaction (Flanagin, 2005). Despite the positive aspects of high levels of social presence (e.g., seeing facial expressions), the online mentoring program's mission may impact the level of social presence desired in an online mentoring relationship. For instance, the literature (Ensher et al., 2003; Hansman, 2002) described the challenges women, people of color and the handicapped face in finding face-to-face mentors. Promoting gender diversity is a common goal

among the mathematics and science community (Holland & Eisenhart, 1990). Ensher et al. (2003) proposed the lack of social presence in e-mail might promote access to mentors for women, people of color and the handicapped. The thought relative to this hypothesis is that the online mentor and protégé can focus on common interests rather than physical characteristics. Would video teleconferencing hinder the ability of women, people of color and the handicapped to obtain mentors?

Two major complications facing research on video teleconferencing in online mentoring are lack of access to video teleconferencing equipment and understanding how to use video teleconferencing. These two constraints may explain the reason why I could find no literature that addressed video teleconferencing within online mentoring relationships for teachers. In addition, schools must have an adequate infrastructure (e.g., bandwidth) to support the use of video teleconferencing. Research exists (Abbott, 2004; Singer, 2005) that describes the emotional support beginning teachers have received from online mentoring via e-mail. The reason I recommend research in using video teleconferencing in online mentoring relationships is to determine the benefits, if any, that exist relative to the second goal of mentoring programs for new teachers: providing role modeling in helping new teachers learn to teach in accordance with standards. In a study conducted by March and Puma (1996), they found that leaders in non-profit organizational members were able to serve as role models to students through the use of video teleconferencing. Empirical-based evidence in these areas may help school administrators determine if the investment in terms of installation and training to use video teleconferencing is worthwhile. Ganzer (2002) noted “Allocating limited staff development resources to teacher mentoring programs demands evidence that their impact runs deeper than anything measured by superficial ‘smile’ evaluations” (p. 48).

On the basis of the results of the study and the ideas portrayed in the literature, I believe online mentoring programs for teachers should consider the following questions.

- What are the professional needs of teachers that are not met by face-to-face mentors?
- Does the mission of the online mentoring program address these unmet needs?
- Do the online mentor and protégé share common professional interests in order to learn reciprocally from one another?
- How do the online mentor and protégé compare in terms of the manner in which they use various forms of CMC? For example, does one person use e-mail frequently while the other person only uses e-mail occasionally?

The first two questions help to establish whether the online mentoring program is addressing professional needs of the teaching community. Mentoring relationships that last are based on the mentor and protégé sharing a common area of interest (Ensher & Murphy, 1997). An affirmative response to the third question maximizes the potential for the online mentoring relationship to produce positive learning results for both parties. The interviewees had different perspectives regarding the value of each form of CMC considered in the study. Frustrations emerge in online mentoring relationships when the mentor and protégé use CMC in different ways (Bierema & Hill, 2005; Harris et al., 1996). In an online mentoring relationship, the mentor and protégé should not only have similar professional interests, but they should also have similar goals for the manner in which they use CMC. The wide range of perspectives regarding the use of chat rooms is one example of a form of CMC in which the mentor and protégé may have very different views.

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APPENDIX

Appendix A

Recruitment Letter

Mr. Marty Thomas from the Department of Educational Psychology and Instructional Technology at the University of Georgia (770-534-6214, athomas@coe.uga.edu) under the direction of Dr. Michael Orey, Department of Educational Psychology and Instructional Technology, University of Georgia (706-524-4028, morey@coe.uga.edu) is conducting a research study entitled "OPPORTUNITIES AND CHALLENGES OF ONLINE MENTORING IN TEACHER EDUCATION". The purpose of this study is to explore how previous experiences of pre- and in-service teachers in the state of Georgia with mentoring and computer-mediated communication (e.g., e-mail, electronic discussion boards) impact their willingness to participate in an online mentoring program. One example of an online mentoring program for teachers is BRIDGE (Building Resources: an Inductive Design for Georgia Educators) (www.teachersbridge.org). The purpose of online mentoring programs is to allow for mentoring relationships when face-to-face interaction is impractical or impossible.

In conducting this research, Mr. Thomas will conduct an online questionnaire, individual interviews and focus groups of 2-4 people in each focus group. Participants can choose to participate in any or all elements of this research. Mr. Thomas will randomly select 2 of the participants in the online questionnaire to receive a $50 gift certificate to amazon.com. Mr. Thomas will give a $10 gift certificate to Blockbuster to each participant in the individual interviews and focus groups. The preliminary portion of the study is the online questionnaire. If you would like to participate in the online questionnaire (estimated time of completion is 10-15 minutes), please go to http://facilitate.coe.uga.edu/MT/letter.htm. The estimated time of the interviews and focus groups is 45-60 minutes each. Please note that Mr. Thomas will only select 10 participants for the individual interviews and 10 participants for the focus groups. In

light of this, Mr. Thomas may not select all of the individuals that express an interest in participating in the individual interviews and/or focus groups.

If you have any further questions regarding this research, please contact Marty Thomas at 770-534-6214 or athomas@coe.uga.edu.

Sincerely,

Marty Thomas, Doctoral Candidate, Department of Educational Psychology and Instructional Technology, University of Georgia
770-534-6214
athomas@coe.uga.edu

Appendix B

Implied Consent Form for Online Survey

Mr. Marty Thomas from the Department of Educational Psychology and Instructional Technology at the University of Georgia (770-534-6214, athomas@coe.uga.edu) under the direction of Dr. Michael Orey, Department of Educational Psychology and Instructional Technology, University of Georgia (770-542-4028, morey@coe.uga.edu) is conducting a research study entitled "OPPORTUNITIES AND CHALLENGES OF ONLINE MENTORING IN TEACHER EDUCATION". The purpose of this study is to explore the impact of previous experiences of in- and pre-service teachers with: 1) mentoring and 2) computer-mediated communication (e.g., e-mail, electronic discussions boards) on their willingness to participate in an online mentoring relationship in the future. You can stop taking part without giving any reason, and without penalty. Please read over the following screen. If you would like to participate in the online survey, please select the "Begin the Survey" button at the bottom of the screen.

If you volunteer to take part in this study, you will be asked to do the following things:

1) Complete an online survey by selecting the "Begin the Survey" button at the bottom of this screen.

2) Estimated time of completion is 20 minutes.

3) Additionally, Mr. Thomas is conducting individual interviews and focus groups (3-4 people in each group). Participants in the individual interviews and focus groups will receive a $10 gift certificate. If you wish to participate in the individual interviews and/or focus group, please contact Mr. Thomas (770-534-6214, athomas@coe.uga.edu). Please note that Mr. Thomas will only select 10 participants for the individual interviews and 10 participants for the focus groups. In light of this, Mr. Thomas may not select all of the individuals that express an interest in participating in the individual interviews and/or focus groups.

Mr. Thomas will randomly select 2 of the survey participants to receive a $50 gift certificate to amazon.com. If you wish to participate in the drawing, you will need to enter your name, mailing address and/or e-mail address after completing the survey. Mr. Thomas will store contact information and survey responses in separate databases. After completion of the drawing, Mr. Thomas will destroy the address listing. Mr. Thomas will destroy the contact information (names, e-mail addresses and mailing addresses) by June 2005. Mr. Thomas will not sell or provide the address listing to another source.

Information from this study will help to improve online mentoring programs for teachers like BRIDGE (Building Resources: An Inductive Design for Georgia Educators) (www.teachersbridge.org). Online mentoring programs like BRIDGE may provide collaborative professional development opportunities between groups of teachers separated by distance. Information from this study will benefit you by providing better mentoring support in your professional development.

No risk is expected.

You have the right to not answer any of the questions within the survey. If you decide to withdraw from participation in the survey while taking the survey, close your web browser or left-click the Cancel button (at the bottom of the survey).

No information about you, or provided by you during the research, will be shared with others without your written permission, except as required by law.

The investigator will answer any further questions about the research, now or during the course of the project (770-534-6214, athomas@coe.uga.edu). Internet communications are insecure and there is a limit to the confidentiality that can be guaranteed due to the technology itself. However

once the materials are received by the researcher, standard confidentiality procedures will be employed.

You understand that by selecting the "Begin the Survey" button you indicate your consent to participate in the online survey.

Additional questions or problems regarding your rights as a research participant should be addressed to Chris A. Joseph, Ph.D. Human Subjects Office, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu

If you wish to participate in the online survey, please select the Begin the Survey button.

Appendix C

Online Survey (with SPSS variable names)

Mentoring: Questions 1 through 3 address your prior experiences with mentoring. For the purposes of this study, consider mentoring as a relationship lasting at least two months for the purposes of professional development between two or more individuals. In this survey, the mentor(s) is/are the person(s) providing the guidance. The protégé(s) is/are the person(s) receiving the guidance.

Question	SPSS Variable Name
1) In the last three years, approximately how many times have you served as a mentor?	NumMent
2) In the last three years, approximately how many times have you been a protégé?	NumProt
3) On a scale of 1 = poor to 5 = excellent, how would you rate your mentoring relationships on average?	MentRate (where 1 = poor, 2 = fair, 3 = good, 4 = excellent, 5 = superior)

Your Experiences with Technology: Questions 4 through 8 address your prior experiences with technology and computer-mediated communication.
(SPSS variable names used for comfort level).
Comfort level: 1 = low, 2 = slightly below average, 3 = average,
4 = slightly above average, 5 = high

Usefulness: 1= No use, 2 = Slightly useful, 3 = Moderately useful,
4 = Highly Useful, 5 = Incredibly useful

Willingness to learn: 1 = Not willing, 2 = Slightly willing,
3 = Moderately willing, 4 = Very willing, 5 = Extremely willing

Question	Comfort Level SPSS name
4) E-mail: Rate your comfort level in using e-mail, the usefulness of e-mail for communicating with others and your willingness to learn about new features in e-mail	EmailCom
5) Instant Messaging: Rate your comfort level in using instant messaging, the usefulness of instant messaging for communicating with others and your willingness to learn about new features in instant messaging	IMComf
6) Chat Rooms: Rate your comfort level in using instant messaging, the usefulness of instant messaging for communicating with others and your willingness to learn about new features in instant messaging	ChatComf
7) Electronic Discussion Boards: Rate your comfort level in using electronic discussion boards, the usefulness of electronic discussion boards for communicating with others and your willingness to learn about new features in electronic discussion boards	DiscComf
8) Video Teleconferencing (e.g.,, WebCAM): Rate your comfort level in using video teleconferencing (e.g., WebCAM), the usefulness of video teleconferencing (e.g., WebCAM)for communicating with others and your willingness to learn about new features in video teleconferencing (e.g., WebCAM)	VidComf

Your use of technology: Questions 9 through 20 address your use of technology and computer-mediated communication (CMC)

Question	SPSS Variable Name
9) How many hours per day do you typically spend on the Internet?	IntHrs
10) Approximately how many e-mails do you typically send each day?	EmailSend
11) Approximately how many e-mails do you typically receive each day?	EmailRec
12) To how many list serves do you belong?	ListBel
13) If you belong to any listserves, how many messages do you typically send to the listserve on a monthly basis?	ListSend
14) If you belong to any listserves, how many messages do you typically receive from the listserve on a monthly basis?	ListRec

Your use of technology (continued)

Question	SPSS Variable Name
15) How long (in years) have you used computers (PC's, Macintosh, etc.)?	YrsComp
16) How long (in years) have you used e-mail (put 0 if you have not used)?	YrsEmail
17) How long (in years) have you used instant messaging (put 0 if you have not used)?	YrsIM
18) How long (in years) have you used chat rooms (put 0 if you have not used)?	YrsChat
19) How long (in years) have you used electronic discussion boards (put 0 if you have not used)?	YrsDisc
20) How long (in years) have you used video teleconferencing (e.g., WebCAM) (put 0 if you have not used)?	YrsVid

Online Mentoring: Questions 21 through 24 address your experiences and perspectives regarding online mentoring. Online mentoring is a relationship that occurs via computer-mediated communication (like e-mail) rather than face-to-face. One example is Mentornet (www.mentornet.net) (a program where female engineering and science students (the protégé) exchange e-mails with practicing engineers and scientists (the mentor) over a period of 8 months. Another example is the Electronic Emissary (emissary.wm.edu) (a program that allows students and teachers (the protégé) to interact with a subject matter expert (the mentor) at a distance via e-mail).

Question	SPSS Variable Name
21) Have you ever participated in a formal online mentoring program as a mentor?	PartOnMent (1 = yes, 0 = no)
22) Have you ever participated in a formal online mentoring program as a mentor?	PartOnProt (1 = yes, 0 = no)

Online mentoring (continued)

Question	SPSS Variable Name
23) Would you be willing to participate in an online mentoring program as a mentor in the future?	WillOnMent (1 = yes, 0 = no)
24) Would you be willing to	WillOnProt (1 = yes, 0 = no)

participate in an online mentoring program as a protege in the future?	

Your Status

Question	SPSS Variable Name
25) Are you're a pre-service teacher	PreServ (1 = yes, 0 = no)

Appendix D

Semi-Structured Individual Interview Guide

1) Describe your mentoring relationships.

Possible probes:

a) How did you find mentors?

b) How did they start?

c) What have been some of the outcomes of your mentoring relationships?

2) Describe to me the process of communicating with your mentor or protégé.

Possible probes:

a) How often did you communicate with them?

b) What types of communication technology do you use?

c) How do you use them (communication technology)?

3) Describe to me your experiences of using technology to communicate with others.

Possible probes:

a) What impact has e-mail, instant messaging, etc. had on you for communicating with others?

b) Describe how you use these technologies.

c) Are there any technologies you would like to use that you don't have access?

d) If you did have access, how would you use them?

e) What types of technology tools do you use to communicate with your mentor or protégé?

f) Are there technologies that would prove useful for interacting with your mentor or protégé that you presently do not use?

g) How would you use them?

4) Describe the factors that would influence your decision to join the teacher's BRIDGE.

Possible Probes:

a) How did your previous experiences with mentoring influence this decision?

b) How did your previous experiences with computer-mediated communication influence this decision?

c) How would you like to communicate with your online mentor or protégé?

d) What types of technology would you like to use?

Appendix E

Semi-Structured Paired Interview Guide

1) An activity: I will have two charts on the board. One chart is labeled “Ease of use”, and the other chart is labeled “Usefulness for communicating”. I will provide each group member with a different colored sticky pad. Each sheet will have the following labels “e-mail”, “instant messaging”, “discussion boards”, “list serves”, “chat rooms”, “video teleconferencing”. I will also provide additional sheets for the participants to list other communication technologies they would like.
2) I will then ask the group what criteria they used for determining “ease of use” and “usefulness for communicating”
3) Describe how these technologies could be used in mentoring relationships.
4) Describe the constraints you face in using particular types of technologies in mentoring relationships.
5) I will then have the group members sit at computer terminals and log into BRIDGE. We will discuss things like:
    a) What do you like about the BRIDGE?
    b) How would you use the BRIDGE?
    c) What improvements should we make to BRIDGE?