

E-Mentoring Interaction Models

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Little research has been conducted on electronic mentoring. Several traditional mentoring models exist; however, due to the novelty of the research area, no theoretical e-mentoring models appear in the literature. Using Moore's Theory of Transactional Distance as the theoretical framework, this research compared mentor-protégé interaction, transactional distance, structure, satisfaction, and support in Internet-based asynchronous and synchronous mentoring settings. Emerging from this study were two e-mentoring interaction models—Mentor Initiation Model and Protégé Collaboration Model.

Keywords: E-mentoring, Internet-based Mentoring, Mentoring Models

Within the last few years, there has been a growing interest in using the Internet to provide mentoring for those choosing careers, for youth making school-to-life transitions (Facemyer, Peterson, Emerson, Van Wingerden, & Perkins 1999), and for teachers desiring to enhance their skills in reading (Lesesne, 1997) and science literacy (Mathew, Barufaldi, & Bethel, 1998). By creating these virtual mentoring environments, participants are able to receive support and exchange information from a central location.

Mentoring in the traditional sense involves a mentor-protégé pair meeting on a regular basis to discuss various issues and share experiences. The mentor is considered the teacher who assists in developing protégé competencies; while the protégé is the student or learner who benefits from the mentor's experience (Cohen, 1999). According to Galbraith and Cohen (1995), mentors assist and guide protégés through transitional periods and influence their personal and professional growth and development.

Internet-based mentoring provides this same sense of sharing and discussion but utilizes Web technologies to support mentoring activities and interactions. Internet-based mentoring is a subset of what Single and Muller (1999) refer to as electronic mentoring or e-mentoring: "a naturally occurring relationship or a paired relationship within a program that is established between a more senior individual (mentor) and a lesser skilled or experienced individual (protégé), primarily using electronic communications, and is intended to develop and grow the skills, knowledge, confidence, and cultural understanding of the lesser skilled individual to help him or her succeed" (p. 236). The communication media used in e-mentoring environments include e-mail, the Internet, telephone, fax, discussion conferencing, and video conferencing.

Statement of the Problem

Research on electronic mentoring, and more specifically Internet-based mentoring, is at its infancy (Single & Muller, 2000). However, three major limitations are evident in the literature: (a) the lack of theoretical Internet-based mentoring models, (b) no research on mentor-protégé closeness (transactional distance) in an Internet-based mentoring environment, and (c) limited scholarly research on youth mentoring.

Several traditional mentoring models exist, but due to the novelty of Internet-based mentoring research few models in this area exist. Single and Muller (1999) propose a model for structured face-to-face mentoring programs, and applies it to the e-mentoring format. Although the model was developed within a higher education context, Single and Muller (1999) indicate that it can be adapted to different types of mentoring programs. This model is very broad in nature and can be applied to not only mentoring but also any educational endeavor. Detailed models that specifically address each mentoring phase are still needed to effectively impact Internet-based mentoring research.

Several studies exist that focus on the transactional distance between the *teacher-student* in distance education *course* environments (Anderson, 1999; Bischoff, 1993; Bischoff, Bisconer, Kooker, & Woods, 1996). Yet, there is no known study that focuses on the transactional distance between the *mentor-protégé* in distance *mentoring* environments.

Rhodes and Noam (2002) indicate that many practitioners are involved in setting up programs, but only a small group of people are dedicated to scholarly mentoring research. Given the steady increase in youth mentoring programs and models, it is essential that researchers converge on some theoretical underpinnings. Research has demonstrated the effectiveness of the traditional one-to-one mentoring models, but little is known about what makes

an effective mentoring program when the model varies from the traditional one-to-one model (Sipe & Roder, 1999). According to Rhodes, Grossman, and Roffman (2002), “a strong pressing need exists for more research on the rapidly emerging [models] of mentoring” (p. 19).

Moore’s Theory of Transactional Distance

In a distance education environment, there is a geographic separation of instructor and student. “With [this] separation there is a psychological and communications space to be crossed, a space of potential misunderstanding between inputs of instructor and those of the learner. It is this psychological and communications space that is the transactional distance” (Moore, 1993, p. 22). Transactional distance is a fusion of the humanistic and behaviorist pedagogical traditions (Moore, 1993). The humanistic tradition emphasized interpersonal, unstructured, and open-ended dialog; while the behaviorist tradition focused on systematic instructional design developed around behavioral objectives. Based on these two traditions, Moore (1991, 1993) further defined the theory of transactional distance as being constructed of two major clusters of variables—structure and dialog. Structure refers to the extent to which a program is responsive to the needs of the individual learner (Moore, 1983; Moore & Kearsley, 1996; Simonson, Schlosser, & Hanson, 1999). It focuses on course organization, course content, delivery medium, teaching strategies, and evaluation of student learning and performance (Moore, 1993; Anderson, 1999). Dialog refers to the teacher-student and student-student communication that takes place (Moore, 1993). Central to this variable is the type of dialog that takes place, the medium used in the dialog, and the strategies used to promote interaction.

According to Anderson (1999), the key to understanding Moore’s theory of transactional distance is understanding the inter-relationships between structure and dialog. For example, transactional distance (feelings of closeness) tends to decrease when dialog and interaction are present (Moore, 1972; Moore 1993; Moore & Kearsley, 1996). If dialog is occurring and communication is high, the relationship between a teacher-student is close. Conversely, transactional distance is increased in the presence of high structure and low dialog (Moore, 1972; Moore, 1993). Moore (1991) indicates that there is no prescribed solution regarding the amount of structure or dialog necessary to achieve minimum transactional distance. Therefore, it is the task of the course designer to evaluate and plan for dialog and structure based on the nature of the course.

Building a Sense of Community

A major goal in distance environments is to ensure that participants feel “connected to” and a part of the environment. Distance educators believe that by creating a sense of community or feeling of belonging, students are likely to persist, actively participate, formulate and build relationships, and convey feelings of satisfaction in that environment (Rovai, 2002; Tinto, 1993). In order to build this community, four elements must be present: spirit, trust, commonality of expectations, and interaction (Rovai, 2002). If these four dimensions are enhanced, stronger feelings of community will develop (Rovai, 2002).

Rovai (2002) suggests that the key element to building a sense of community is interaction. He further postulates that, “if we cannot fully promote a sense of community through the quantity of interaction, we must foster community through the quality of the interaction” (p. 5). An environment filled with interaction is not necessarily a portrayal of community. Rather, quality, meaningful interaction must also exist in the environment. Many factors influence the quality of interaction, and hence the sense of community. These include transactional distance, social presence, social equality, small group activities, group facilitation, teaching style and learning stage, and community size (Rovai, 2002). The two factors directly related to this study are transactional distance (explained in the previous section) and social presence.

Short, Williams, and Christie (1976) coined the term social presence and defined it as “the degree of salience of the other person in the interaction and the consequent salience of their interpersonal interactions” (p. 65). Gunawardena and Zittle (1997) simplified this definition to describe it as the degree to which a person is perceived as “real” or “salient” in the mediated communication. Rourke, Anderson, Garrison, and Archer (1999) add that social presence is the “ability of learners to project themselves socially and affectively into a community of inquiry” (p. 50). Social presence conjures up the idea of a psychological, emotional, and interpersonal connectedness within a mediated environment. It also carries with it a mutual sense of interaction and awareness by other participants in the environment. The communication medium is key to successful dialog and interaction (Moore, 1993) and should allow participants to be so immersed in the environment that the presence of a medium is not apparent. Further, the communication medium must be able to support high levels of interaction and allow participants to transmit nonverbal cues, such as facial expressions, feelings, and emotions so that they feel emotionally attached and feel a sense of community (Gunawardena & Zittle (1997). This results in enhanced social presence. If social presence is

high in a CMC environment, can it be concluded that participant satisfaction will be high as well? Results from studies conducted by Gunawardena and Zittle (1997) and Hackman and Walker (1990) suggest that social presence is a strong predictor of satisfaction.

Discussions of building a sense of community, transactional distance, social presence, and satisfaction have created a stream of relationships and interrelationships. Anderson (1999) pointed out that the key to understanding Moore's theory of transactional distance is understanding their interrelationships. Similarly, the researcher provided an extension to this concept—the key to understanding building community in a mediated environment is understanding the interrelationships of structure, interaction, feelings of closeness, social presence, and satisfaction.

Purpose of the Study

The purpose of this study was to: (a) compare protégé feelings of closeness, perceptions of interaction, structure, support, and satisfaction in synchronous (real-time) and asynchronous mentoring environments and (b) identify any relationship between these constructs. Moore's Theory of Transactional Distance provided the theoretical framework for investigating the relative closeness of mentors and protégés in an Internet-based environment. Although Moore's theory is written in the context of interactions and dialog between a *teacher and a student*, this study utilized the theory in the context of interactions between *mentor-protégé groups*. The following research questions were used to focus the study:

1. To what extent do protégé satisfaction and perceptions of interaction, structure, support, and closeness (transactional distance) differ in a synchronous mentoring environment and an asynchronous e-mentoring environment?
2. What are the interrelationships between interaction, structure, support, satisfaction, and closeness (transactional distance)?

Methodology

A static-group comparison design was utilized in this study. The MISS was distributed to synchronous mentoring groups and asynchronous mentoring groups. Mann-Whitney U-tests were used to compare protégé feelings of closeness, perceptions of interaction, structure, support, and satisfaction in synchronous and asynchronous mentoring environments. Pearson product-moment correlations were computed to identify any relationships between these constructs.

Sample

Participants in this study were 46 girls ranging between the ages of 10 and 14 years old. They were students from five elementary and middle schools in the Midwest. The ethnic groups represented were: 3 Asian/Pacific Islander (6.5%), 27 Black/African American (58.7%), 5 Multi-racial (10.9%), and 11 White (23.9%). Twenty-one of the participants had Internet access at home. Twenty-eight participants indicated that they had 1 or more years of computer experience; ten had 1 to 11 months computer experience, and the remaining eight did not respond.

Seven adult females trained by the ABC Mentoring program served as the girls' mentors. Each mentor was assigned 8-10 girl participants who served as their protégés. Half of the protégés participated in asynchronous mentoring activities, and the other half in synchronous mentoring activities. These placements were based on their age, school affiliation, and Internet access. Participants who were the same age \pm 1 year were placed in the same mentoring groups. Asynchronous mentoring groups were able to post messages on separate password-protected WebBoard™ discussion boards, whereas synchronous mentoring groups protégés were able to post messages to their own boards as well as participate in real-time chat sessions via the WebBoard™ chat facility.

Instrumentation

The Mentoring Interaction, Support, and Structure (MISS) survey was utilized in this study. It is an adaptation of Shaik's (2002) Class Interaction, Structure, and Support (CISS) survey. The CISS survey was used to collect data on students' perceptions of class dialog, structure, support, and transactional distance relative to their college learning environments. The instrument contained 3 demographic items, 32 Likert-scale items, and 3 open-ended items. Items were reworded to refer to a mentoring environment. Questions pertaining to protégé satisfaction were added. The satisfaction questions were adapted from the GlobalEd questionnaire developed by Gunawardena and Zittle (1997).

Girls ages 10 to 17 who did not participate in the study pilot tested the MISS survey. Based on these results, the instrument was revised and finalized. The resulting MISS survey contains 31 Likert-scale questions with response choices of: strongly disagree, disagree, agree, and strongly agree. Nine survey items address interaction, six address structure, seven focus on protégé support, five address protégé satisfaction, and four address feelings of closeness.

Data Collection and Analysis

Mentoring groups began meeting online for 30-45 minutes each week for a total of eight weeks. To ensure that each participant utilized the discussion boards, the researcher arranged a computer lab time at each school where she would monitor the girls, assist them in logging in and posting messages, and answer any questions. Girls who had Internet access at home were not required to attend the computer lab sessions but were allowed to attend if they preferred.

At the end of the 8-week mentoring period, the MISS survey was distributed to the protégés to measure their perceptions of structure, interaction, feelings of closeness, and satisfaction. The researcher entered survey data into an Excel database. Means, medians, and standard deviations of the participants' perceptions of interaction, feelings of closeness, support, and satisfaction for each mentoring group were computed. Mann-Whitney U tests were performed to determine if differences in medians were statistically significant. Correlation coefficients were also computed to see if there were any relationships between the constructs. The value of r would provide information about the strength and the direction of the relationship between the constructs.

Delimitations and Limitations of Study

The researcher imposed several limitations on this study. First, this research focused on a mentoring program that used Internet-based technologies as the communication medium for carrying out mentoring activities. Second, the researcher utilized an existing mentoring program for the mentoring curriculum. Mentors and protégés registered in this mentoring program served as study participants. A third limitation was that protégés who did not have Internet access at home were constrained to performing online mentoring activities at their school's computer lab or in a public facility with Internet access. A fourth limitation was this research focused on interaction, structure, satisfaction, and support and their relationship to transactional distance (feelings of closeness). Other factors such as race, culture and ethnicity were not studied.

Results

At the onset of the study, there were 63 girls assigned to 7 mentoring groups. Thirty five were assigned to the asynchronous mentoring groups, and twenty eight were assigned to the synchronous mentoring groups. As the study progressed, 17 of the 63 girls resigned their participation due to busy schedules (5), lack of interest (8), and conflicting chat schedules (4). This resulted in 46 participants—29 asynchronous and 17 synchronous protégés. Although a total of 17 girls were assigned to the synchronous mentoring groups, 8 of these protégés did not utilize the chat facility due to scheduling conflicts. They posted messages to the discussion board like the asynchronous mentoring groups. This resulted in a total of 9 "true" synchronous protégés.

At the end of the 8-week mentoring period, the researcher visited each school to administer the MISS survey. There was an 89% return rate—41 out of 46. Two of the girls relocated two weeks before the school year ended and the other three were absent from school. The researcher left surveys with the girls' teachers and counselors for them to complete. However, they did not return the surveys when the researcher returned to the schools to collect them.

Mean and median scores for each group type—asynchronous and synchronous, were computed on each construct. To compare the medians of both groups, Whitney Mann U -tests were performed. Results revealed no significant differences ($p < .05$) between any of the constructs.

E-mentoring Interaction Models

Compared to all mentor participants, Mentors 6 and 7 were the most participatory in their interactions with their protégés. Mentor 6 posted 18 messages on the asynchronous discussion board and 31 on the synchronous discussion board. Mentor 7 posted 10 messages on the asynchronous board, posted 6 messages on the synchronous discussion board, held 3 synchronous chat sessions with her protégés, and met face-to-face with her protégés during week 7 of the e-mentoring period.

Additionally, these two mentors were persistent and enthusiastic in their postings. If the protégés had not replied to her postings, Mentor 6 would re-post with another more descriptive topic or write the topics in Spanish

with the English translation next to it. Both mentors would provide emphasis to topics through the use of exclamation marks, all capital letters, or a combination of the two.

In contrast, the postings for Mentors 1, 2, 3, 4 and 5 were not as frequent. The total number of mentor postings for each group ranged between 2 and 8. In spite of the mentors' minimal postings, the protégés continued posting to the board. Some protégés were relatively inactive participants, posting as little as 2 messages, while some protégés posted as many as 19 messages. The more active protégés could be seen as peer mentors, providing advice and support to other protégés. Because the mentor was not as involved in the interactions, topics were more social in nature, e.g., introductions, graduation, schools attended, and extracurricular activities.

Emerging from these differing modes of mentor activity were two e-mentoring interaction models: (a) the mentor initiation model (MIM) and (b) the protégé collaboration model (PCM). Both models utilized a combination of what the researcher refers to as interaction schemes—mentor-protégé interaction, protégé-protégé interaction, mentor-prompted interactions, and protégé-prompted interactions. The mentor-protégé interaction and protégé-protégé interaction are equivalent to the learner-instructor and learner-learner interactions proposed by Moore (1989). The mentor-prompted interactions and protégé-prompted interactions provide additional information on who initiated the interaction. These four interaction schemes were found in both the MIM and PCM; however, for each model one interaction scheme was more prevalent than the other.

The MIM (Figure 1) is similar to the traditional mentor-protégé model where the mentor initiates the interaction and leads the discussions. The mentor-protégé and mentor-prompted interactions schemes are common in this model. Mentors 6 and 7 utilized the MIM, where they led most of the discussions, and the protégés responded. If the mentors posted a question to the discussion board, the protégés replied to the mentor or other protégés in their group. The mentors of the MIM group were most active, ensured that the protégés were reading the posted chapters, and followed up with phone calls and reminders to protégés about chat times.

The remaining mentoring groups utilized another form of interaction that was different from the MIM. This other form of interaction is referred to as the protégé collaboration model (PCM). The PCM (Figure 2) is similar to a peer mentoring model, where protégés assist one another, taking on the role of mentor or advisor when needed. Unlike the MIM, the mentor is less “visible” in this model. The protégé-protégé and protégé-prompted interaction schemes are common in this model. Rather than the mentor initiating interactions as in the MIM, the protégé initiates the interaction. Mentors 1, 2, 3, 4, and 5 utilized the PCM, which resulted in increased protégé-protégé interactions.

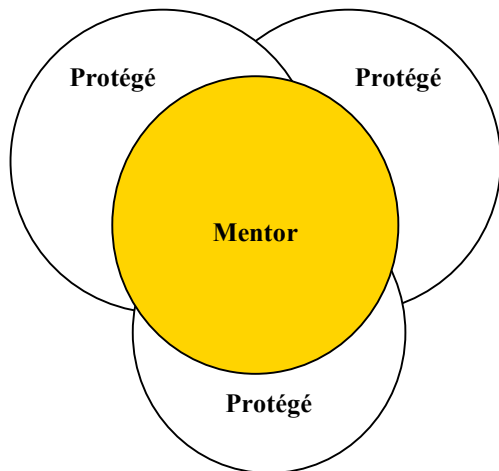


Figure 1. Mentor initiation model.

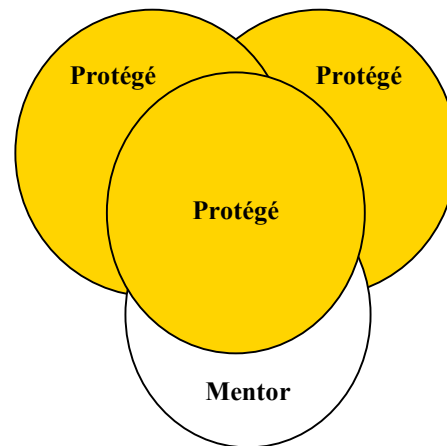


Figure 2. Protégé collaboration model.

Correlations

Pearson product-moment correlation coefficients were computed to determine the interrelationships between interaction, structure, support, satisfaction, and closeness constructs in each e-mentoring environment and for each e-mentoring interaction model. For the asynchronous mentoring group and the PCM, the associations were moderately strong and statistically significant ($p < .05$) for all constructs except closeness. For example, as scores on interaction increased (or decreased), the scores on the structure, satisfaction, and support also increased (or decreased). For the synchronous mentoring group and the MIM, the associations were moderately strong to strong

and statistically significant ($p < .05$) for all constructs. As scores on one construct increased (or decreased), the scores on the other four constructs increased (or decreased).

The closeness correlations were strong for the synchronous mentoring groups. However, there was nearly no relationship between closeness and the other constructs in the asynchronous mentoring groups. Similarly, the closeness correlations were moderately strong for the MIM groups, but there was nearly no relationship between closeness for the PCM groups. Although predictions cannot be made from the correlation coefficient data, how data move in relation to other data can be made. The data suggest that mentors in synchronous and MIM e-mentoring environments are perceived by their protégés as active, responsive, and involved. This results in positive perceptions of interaction, structure and support, and increased levels of satisfaction and feelings of closeness.

Conclusions

Based on the research findings, it can be concluded that (1) when mentors were not active participants, protégés within a group emerged as peer mentors; (2) the relationship between closeness and the other constructs was stronger in the synchronous environment than in the asynchronous environment; (3) the relationship between closeness and the other constructs was stronger in the mentor initiated group than in the protégé peer mentoring group, and (4) there were little differences between constructs in the asynchronous and synchronous environments.

Protégés Emerge as Peer Mentors

Peer mentoring is identified as an alternative to traditional mentoring where there is a shortage of mentors, or where access to mentors is limited. In this study, when access to mentors was limited and mentors were not actively participating in discussions, protégés emerged as peer mentors. The researcher referred to this mentoring strategy as the Protégé Collaboration Model. In spite of the mentors' minimal postings, the protégés continued posting to the board. The most active protégés emerged as peer mentors, providing advice and support to other protégés.

Stronger Relationship in Synchronous Environment

The relationship between closeness and the other constructs was stronger in the synchronous e-mentoring environment, suggesting that closeness may be linked to this environment. Interactions within the synchronous groups were in real-time. This created what Lombard and Ditton (1997) coined presence as transportation. They defined this term as the extent that participants are able to transcend space and feel as if "They are there" (transported to another place), and "We are together" (two or more communicators are transported together to a place that they share). If a mediated environment can create a "we are there" atmosphere, it has succeeded in its goal of creating social presence, sense of community, satisfaction, and thus closeness. By nature of the synchronous e-mentoring environment, protégés and mentors who communicated via the chat facility were able to transcend space and feel as if they were together in the same place. This result was also consistent with Chen and Willits (1998) study which indicated that the relationship between dialog (interaction) and transactional distance depended on the type of dialog (interaction). Further research is needed to support these findings.

Stronger Relationship in the MIM

The relationship between closeness and the other constructs was stronger in the MIM than in the PCM. This suggests that there may be a link between closeness and the level of mentor participation. In the MIM, the mentor actively participated in discussions and initiated most of the interactions. If the mentors posted a question to the discussion board, all of the protégés posted a reply and were quite involved. In the PCM, the mentor was less active and more of a distant participant.

No Significant Difference

Regardless of the group type—asynchronous or synchronous, results revealed no significant difference between any of the constructs. Similar results were found in studies by Styles and Morrow (1992), Bischoff (1993) and Bischoff, Kooker, and Woods (1996). Styles and Morrow (1992) compared satisfied and dissatisfied mentor-protégé pairs and found no significant difference in the activities in which they engaged. Bischoff (1993) and Bischoff et al. (1996) compared face-to-face learning with two-way interactive television learning in public health and nursing graduate programs and found no significant difference in transactional distance between the two learning environments.

Although these studies found no significant difference between groups on a particular construct, each study noted differences in which these groups interacted. In this study, real-time and frequent mentor interaction yielded strong closeness correlations. Styles and Morrow (1992) noted differences in mentors' interaction styles and approach to identifying protégé problem areas. Bischoff (1993) and Bischoff et al. (1996) found more dialog or interaction in the interactive television learning environment than in the face-to-face environment.

Another plausible explanation for the "no significant difference" results is that the researcher visited the schools each week to assist the protégés in the computer lab. The protégés could have perceived the researcher as their

surrogate mentor, such that any lack of closeness they may have felt toward their mentor was displaced by the researcher's presence each week.

Further enlightenment on the "no significant difference" result is found in Moore's conceptualization of transactional distance (Moore, 1972; 1973; 1993). He points out that transactional distance (feelings of closeness) is not only a function of structure and dialog but it is also a function of learner autonomy—a person's ability to set learning goals and strategies independent of directions by the instructor (Moore, 1993). Most of the protégés in this study had Internet experience and were comfortable using the computer. This level of Internet autonomy could have reduced their reliance on their mentors to post messages on the discussion board and reduced any perceptions of transactional distance (closeness).

Future Research Implications

This study compared mentor-protégé interaction, transactional distance (feelings of closeness), structure, satisfaction, and support in Internet-based asynchronous and synchronous mentoring settings. Results revealed no significant difference between these constructs in these settings. Since this is the first of its kind, this study should be repeated in different schools and with larger sample sizes. It should also be repeated using adult e-mentoring programs, such as MentorNet, NetMentors and iMentor. It would be interesting to compare results from youth and adult e-mentoring settings and identify similarities in concepts.

Most of the protégé participants had Internet experience and were comfortable using the computer. This level of Internet autonomy could have reduced their reliance on their mentors to post messages on the discussion board and reduced any perceptions of transactional distance (closeness). An interesting study could address this notion of Internet autonomy and its relationship to interaction, satisfaction, and closeness in asynchronous and synchronous e-mentoring environments.

Two e-mentoring interaction models emerged from this study—the Mentor Initiation Model (MIM) and the Protégé Collaboration Model (PCM). A proposed research study could focus on the evolution of mentor-protégé and protégé-protégé interactions, and the development of mentor-protégé relationships in each of these models. Traditionally, research has been conducted on one-to-one mentoring (one mentor to one protégé). In this study, group mentoring (one mentor to 3-4 protégés) was utilized. A comparison of closeness, interaction, satisfaction, and support in one-to-one e-mentoring and group e-mentoring would be another interesting study.

In the adult mentoring literature, Allen and Poteet (1999) found that in order to increase the effectiveness of the mentor-protégé relationship, open communication, trust, and goals must be established. Similarly, Kram (1988) suggested that interpersonal, communication, and listening skills are keys to quality adult mentoring relationships. Central to the MIM and PCM proposed in this study is the communication or interaction of the protégés and mentors. A study focusing on adult e-mentoring or face-to-face mentoring programs could be conducted to validate these two models.

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