

E-mentoring for social equity: review of research to inform program development

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The advent of user-friendly email programs and web browsers created possibilities for widespread use of e-mentoring programs. In this review of the research, we presented the history of e-mentoring programs and defined e-mentoring and structured e-mentoring programs, focusing on large-scale e-mentoring programs that addressed issues of social equity and educational advancement. The literature reviewed spanned from the mid-1990s to the present and included journal articles, reports, and book chapters on implemented e-mentoring programs. The literature indicates that e-mentoring is not a panacea, neither is it an inexpensive alternative to face-to-face mentoring. E-mentoring is an alternative mode that facilitates the expansion of mentoring opportunities. The research we reviewed supported that the benefits associated with e-mentoring mirrored the benefits associated with mentoring: informational, psychosocial, and instrumental. In addition, research supports two additional benefits of e-mentoring: the value of impartiality and inter-organizational connections, which were facilitated by the use of electronic communications. Research conducted on the programmatic features associated with e-mentoring programs identified training, coaching, and group e-mentoring as features that enhanced participant involvement. Our goal in providing a review of the research at this stage in the development of e-mentoring was to facilitate increased understanding of the current research to enhance future research and programs and to advance e-mentoring as a field.

In 1985, America On-Line (commonly known as AOL—a user-friendly email program that was marketed widely to the US public) greatly expanded access to email, which had previously been used mainly by researchers and scholars associated with universities, colleges and national laboratories. In 1994 the World Wide Web was made more accessible to the American public through the introduction of user-friendly web browsers such as Netscape. With the launch of Netscape, the Internet's potential for facilitating commerce and business transactions was immediately

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recognized. Afterwards, the Internet's potential for supporting programs that addressed social justice and educational equity was also recognized (Muller, 1997). Since the widespread availability of the Internet, journals and edited books addressing topics such as the Internet and society, technology and education, and technology and mentoring are growing in numbers.

While the literature on e-mentoring (also known as telementoring) has been increasing, only recently has a body of research been accumulated that addressed the impact of e-mentoring and the efficacy of structured e-mentoring programs. In this paper, and as researchers in the field of e-mentoring, we reviewed and presented this research and focused on the outcomes or benefits associated with structured (and therefore formal)

e-mentoring programs. In particular, we focused on programs that addressed issues of social equity and educational advancement. We also reviewed the research conducted on the features of structured e-mentoring programs and identified the features that were most efficacious.

As an introduction to the review, we provided a brief history of mentoring and technology. In addition, we operationalized and defined terms to ensure common interpretation and understanding.

History of e-mentoring programs

Mentoring describes when knowledgeable, experienced persons (i.e. *mentors*) support the personal or professional development of newcomers or less knowledgeable persons (i.e. *protégés*) (Levinson *et al.*, 1978). Even after the Mentoring movement had grown in popularity, the field still had room for improvement. Early experiences with failed programs, or at least programs that did not meet initial expectations, forced researchers and practitioners to rethink how to develop and implement mentoring programs (Boice, 1990; Freedman, 1992; Wunsch, 1994).

AOL and Netscape's role in expanding the use of email and the Internet influenced the widespread use of e-mentoring. Informal e-mentoring probably occurred as soon as email began; that is, soon after researchers and scientists began using the ARPANET, USENET, and BITNET networks in the late 1970s and early 1980s. It took the democratization of the Internet through AOL and Netscape for us to see the development of large-scale e-mentoring programs.

E-mentoring programs arose for many of the same reasons that face-to-face mentoring programs were developed. Face-to-face mentoring programs developed out of the realization that that early support assisted in socialization and enculturation (Chao, 1988; Boyle & Boice, 1998a) and that informal or naturally occurring mentoring relationships were not equitably available (Ragins & Cotton, 1991; Boice, 1993; Turner & Thompson, 1993; Hamilton & Scandura, 2002). Like mentoring programs, e-mentoring programs could 'level the playing-field' by providing mentoring opportunities for those who otherwise would be left out of important informal networks. It was not surprising that the earliest e-mentoring programs, similar to the earliest mentoring programs, focused on creating educational and professional opportunities for underprivileged or underrepresented populations (such as women in engineering or underprivileged students), or focused on areas of national need (such as support for school-aged students' access to science and to scientists) (Bierema & Merriam, 2002).

Early in the Mentoring movement, mentoring programs did not live up to their full potential (Freedman, 1992). Practitioners and researchers realized that formal mentoring programs required programmatic supports to facilitate the establishment and maintenance of face-to-face mentoring relationships (Murray, 1991; Wunsch, 1994; Boyle & Boice, 1998b). The same has proven true for e-mentoring. Harris, *et al.* (1996), O'Neill, *et al.* (1996), and Single and Muller (2001) all reported that sustaining mentoring relationships across email was challenging and required the use of programmatic supports.

This review of the research included reports, journal articles, conference proceedings, and book chapters that reported on evaluation and research findings pertaining to implemented e-mentoring programs. The literature was from the mid-1990s to the present. We began the literature review by searching Education Resource Information Center (<http://www.eric.ed.gov/>), conducting web-searches, reviewing *Mentoring & Tutoring*, checking web sites of e-mentoring programs, and contacting researchers in the field of e-mentoring. We limited the review to programs that focused on issues of social equity or educational advancement and programs that paired dyads made up of e-mentors and protégés.

While both e-mentoring and telementoring are terms routinely used, we preferred the term *e-mentoring* because it more closely inferred that text-based electronic communications (such as email or web-mail) were the primary medium used to support these relationships, as opposed to *telementoring*, which may inadvertently infer that telephone or telephony equipment (media that electronically transmits voice communications) served as the medium through which the mentoring relationships were being conducted.

We determined that the Electronic Emissary Project, founded in 1993, was the first large-scale e-mentoring

program (Harris, *et al.*, 1997). The focus of this program was to match K-12 public school students working on discipline-specific projects with subject-matter experts in those disciplines. Soon afterwards, other e-mentoring programs emerged. The Telementoring Young Women in Engineering and Computing Project (Telementoring Young Women Project), founded in 1994, was the first federally funded research project. The Telementoring Young Women Project examined the efficacy of using e-mentoring to encourage female high school students' interests in computers and computer-related fields, fields in which women were (and are) underrepresented (Bennett, *et al.*, 1998).

In 1994 the International Telementoring Project was being piloted as the Hewlett Packard Email Mentoring Project (Bennett, *et al.*, 1997), which paired K-12 public school students with professionals in partnering corporations to assist students with their class projects. The partnering organizations were technology and Internet companies, so school students had access to professionals in those fields. The International Telementor Project was the largest e-mentoring program in the world, based on the numbers it had served, which included over 15,000 school-aged and college-aged students worldwide (International Telementor Program, 2003). In 1995 the Dartmouth College Women in Science E-mentoring Program was founded; it later expanded and evolved into MentorNet. MentorNet was the second largest e-mentoring program, based on the protégés served; it had provided e-mentoring opportunities for over 11,000 female undergraduate and graduate students since 1998 (MentorNet, 2004). This program paired female science, technology, engineering, and mathematics (STEM) college students with industry professionals to support interest and retention in the STEM fields (Muller, 1997).

These early non-profit projects informed the e-mentoring field about many essential aspects of conducting e-mentoring programs, such as the importance of ready access to technology (Bennett, *et al.*, 1997; Bennett *et al.*, 1998a; Harris, *et al.*, 1997). The importance of access to technology was underscored in an interesting and serendipitous intervention study. Friedman, *et al.* (2004) conducted an e-mentoring program where they paired inner-city high school students (protégés) with college students (e-mentors). Access to technology, based on limited hardware, was a major obstacle, which kept the inner-city students from responding to their e-mentors. Halfway through the program, the researchers obtained portable keyboards with word-processing capabilities through which documents could be uploaded via a wireless connection. The provision of these portable keyboards provided ready access to technology for the protégés. Afterwards, the quality of the e-mentoring relationships, and the targeted skills of the protégés, increased dramatically.

The field of e-mentoring has continued to grow at a rapid pace. Programs have been developed that have not relied on the traditional mentoring dyad, but that relied on communal models or group e-mentoring (Packard, 2003; Phillion, 2003; Russell & Perris, 2003). Scholars in the field have developed and shared sophisticated computer programs (O'Neill, *et al.*, 2005), developed models and standards for assessing the efficacy of e-mentoring programs (Rickard, 2004), or provided e-mentoring tool kits and web portals (National Mentoring Partnership, 2003) to support the development of structured e-mentoring programs. Scholars have also pulled together collections of e-mentoring papers that presented e-mentoring programs, explored the possibilities that mentoring and technology offered, identified unexpected consequences, and reported on the various types of features and infrastructure used to support the programs (Kealy & Mullen, 2003a, b; Kochan & Pascarelli, in press). Researchers have investigated matching protocols, and found that perceived similarity, not demographic similarity, was an important variable on which to match e-mentors with protégés (Ensher, *et al.*, 2004). Other scholars have written conceptual and theoretical articles in which they discussed e-mentoring and e-mentoring programs, their potential and applications, and suggested directions in research (Bierema & Merriam, 2002; Hamilton & Scandura, 2002; Ensher, *et al.*, 2003; Kealy & Mullen, 2003a, b).

Before we addressed the research associated with e-mentoring and the features of e-mentoring programs, we wanted to avoid one of the common pitfalls found in the mentoring literature, that of multiple meanings. Therefore, we provided definitions for e-mentoring and structured e-mentoring programs.

Definition of e-mentoring and e-mentoring programs

Single and Muller (2001) defined e-mentoring as:

A relationship that is established between a more senior individual (mentor) and a lesser skilled or experienced individual (protégé), primarily using electronic communications, and that is intended to develop and grow the skills, knowledge, confidence, and cultural understanding of the protégé to help him or her succeed, while also assisting in the development of the mentor. (p. 108)

This definition of e-mentoring was built on definitions of mentoring and noted that e-mentoring, like mentoring, could be efficacious to mentors (Healy & Welchert, 1990). By relying on this characterization of e-mentoring, we limited this literature and research review to programs that primarily paired protégés and mentors in one-on-one relationships. Programs were not included that had group e-mentoring as their primary focus. Although, we did include programs if the main feature of their program was one-on-one e-mentoring supplemented by group e-mentoring.

While the preceding definition could apply to either naturally occurring relationships or those facilitated through a program format, the following addressed structured e-mentoring programs:

E-mentoring that occurs within a formalized program environment, which provides training and coaching to increase the likelihood of engagement in the e-mentoring process, and relies on program evaluation to identify improvements for future programs and to determine the impact on the participants. (Single & Muller, 2001, p. 108)

This definition was based on the work of the face-to-face mentoring field, and acknowledged the importance of program structure to develop and implement successful e-mentoring programs. Training and coaching were identified as important features of structured e-mentoring programs. Research and evaluation were emphasized as ways to support continuous program improvement and to determine the outcomes of the programs.

E-mentoring is not a panacea

Although interest in e-mentoring has been increasing, e-mentoring is not a panacea. A leading e-mentoring researcher, Judi Harris, stated that ‘e-mentoring should only be done when face-to-face mentoring isn’t available, feasible, or appropriate’ (National Mentoring Center, 2002). Other pioneers in the field echoed this statement. They posited that e-mentoring could take the place of face-to-face mentoring when traditional mentoring was ‘impractical’ (O’Neill, *et al.*, 1996, p. 39) or when connections could be made most effectively over electronic communications (Muller, 1997). E-mentoring practitioners and researchers have not suggested that e-mentor-ing replace face-to-face mentoring, but have viewed it as a way to provide mentoring opportunities that otherwise would not exist.

E-mentoring is not an inexpensive alternative to face-to-face mentoring (National Mentoring Center, 2002). Rather, because of the need to develop a web site and program software, ‘the ease with which e-mentoring programs can be developed may belie the planning, administration, and resources required to make them successful’ (Single & Muller, 2001, p. 108). Web sites, matching protocols, and software to facilitate management and evaluation of the e-mentoring programs require costly information technology (IT) resources, which are often in short supply for non-profit and educational support programs.

Not only do the technology and infrastructure require costly resources, but e-mentoring exacerbates some of the obstacles to successful mentoring. Research on face-to-face mentoring identified time scheduling and geographical obstacles as the main reasons pairs did not develop or maintain their mentoring relationships (Noe, 1988; Dickey, 1997). E-mentoring and electronic communications have fewer reinforcement cues that encouraged the maintenance of a relationship (Sproull & Kiesler, 1992). Therefore, research confirmed that it was relatively easy for participants to sign up for an e-mentoring program, to fail to follow through, and to ignore email messages from either the program staff or their e-mentoring partners (Kasprisin, 2003); the chances of running into a mentor or a program coordinator in the hallways were virtually nonexistent. There were few penalties for deleting an email message in one’s inbox.

On the other hand, in addition to the opportunities it provided, some aspects may make e-mentoring even more advantageous than face-to-face mentoring. These aspects include the attenuation of status differences, the ability to participate in mentoring programs without the fear of being viewed as participating in remediation

programs, and the opportunity to be matched with an e-mentor outside of one's geographical region and established networks. E-mentoring also eliminated unproductive 'windshield time' driving to and from appointments, as stated by David Neils, the founder of the International Telementoring Project (National Mentoring Center, 2002).

Research on outcomes

E-mentoring research supports that e-mentoring provided many of the benefits associated with face-to-face mentoring. In particular, all of the benefits associated with mentoring were found to hold true in e-mentoring. Mentoring provided informational, psychosocial, and instrumental benefits (Single, 2004). Informational benefits referred to the transfer of information and subject-matter that benefits a newcomer. Psychosocial benefits referred to self-esteem enhancement, confidence building, and support for risk-taking that protégés gained from successful mentoring relationships. When mentors provided opportunities for protégés and championed them with colleagues, then the protégés were the beneficiaries of instrumental benefits.

E-mentoring provided the same types of benefits (Lewis, 2002; Single, *et al.*, 2002; Ensher, *et al.*, 2004). In addition, e-mentoring facilitated relationships where protégés benefited from the value of impartiality and from inter-organizational connections.

Value of impartiality

When traditional mentoring was used as a form of professional development, frequently the mentoring occurred within the same organization, and the mentors served as supervisors or managers to the protégés (Kram, 1983). Even when the protégés were not reporting directly to the mentors, but were in the same organization, the mentors' assessments and judgments of the protégés could have influenced the protégés' professional advancement.

While this may not always be negative, protégés often were reluctant to expose gaps in knowledge or self-doubts to mentors in positions of influence over their careers. Research on face-to-face mentoring programs supported this concern. For instance, Boyle and Boice (1998b) reported on two face-to-face structured mentoring programs within university settings, one of which provided mentoring for new faculty. Based on the recent hiring patterns, it was not possible to pair new faculty with senior colleagues in the same departments. Therefore new faculty members were paired with senior faculty in other departments and sometimes with administrators. At the end of the program, the mentoring dyads paired across-departments reported higher ratings on a mentoring index, compared with the pairs where both members were from the same departments. When paired with senior faculty members in departments other than their own, the protégés, 'could feel free to express concerns, reveal weaknesses, and question suggestions without fear that these actions may prove detrimental to retention, tenure, and promotion decisions' (Boyle & Boice, 1998b, p. 173).

E-mentoring took this benefit one step further. Because geographical distances and scheduling differences no longer were obstacles to engaging in mentoring, e-mentors and protégés could be from two completely different organizations, not only different departments within the same geographically proximate organizations.

Research on various e-mentoring programs supported the value of impartiality. The Telementoring Young Women Project focused on female high school students and paired them with women professionals in engineering, science, and computing, with the goal of increasing interest in these fields. Research on the Telementoring Young Women Project highlighted the importance of impartiality for the protégés. Bennett, *et al.* (1998b) reported that: 'many students said that their mentors were "more than a friend but not like a parent" in that they provided advice and support that was not judgmental' (p. 25). Research on MentorNet found that college students appreciated being paired with someone who was neither in an advising role nor in a role of authority over them. The women college students appreciated having a 'neutral place' to disclose and discuss

concerns about their academic majors and their future careers. One protégé stated:

The most valuable aspect was being paired up with a complete stranger and getting to know their life, as well as them getting to know you. It was valuable to me to be able to go to a neutral person on work place, scholastic, and personal matters. (Ithaca Evaluation Group, 1999, p. 21)

Apparently, impartiality allowed the e-mentoring relationships to develop to the point where there was trust and openness within the e-mentoring pairs. This facilitated the development of a relationship that could foster the informational, psychosocial, and instrumental benefits provided by mentoring.

Inter-organizational connections

Because electronic communications spans geographical distances, e-mentoring could connect protégés with mentors in other organizations much more readily than if only relying on face-to-face meetings. E-mentoring programs broke down geographical and organizational barriers for one-on-one mentoring (O'Neill, *et al.*, 1996; Harris, *et al.*, 1997; Lewis, 2002) and for group e-mentoring (Single, *et al.*, 2000; Packard, 2003; Russell & Perris, 2003).

The advantage of inter-organizational connections was that protégés had opportunities to learn from e-mentors who were outside of their usual networks. Granovetter (1973) referred to the positive opportunities afforded by this diversity as 'the strength of weak ties'. An advantage of weak ties is that 'those to whom we are weakly tied are more likely to move in circles different from our own and will thus have access to information different from that which we receive' (p. 1371).

Many e-mentoring networks capitalized on this benefit. Friedman, *et al.*'s (2004) program, as mentioned earlier, paired inner-city high school students with college students, which allowed the protégés to benefit from inter-organizational connections. The protégés were able to 'reach beyond their own community and to talk to people they would not normally have access to' (Friedman, *et al.*, 2004, p. 20). The Electronic Emissary Project also facilitated inter-organizational connections, which were a necessary component of the program. The Electronic Emissary Project paired K-12 students with professionals who served as subject-matter experts (SMEs). The SMEs assisted the students with specific projects assigned by their teachers and offered expertise that was outside of the knowledge-base of the teachers (Harris, *et al.*, 1997). The Electronic Emissary Project leveraged the widespread use of electronic communications and allowed school students to benefit from having professionals 'enter' their classrooms while overcoming obstacles posed by geographical boundaries and scheduling difficulties.

MentorNet also required connections across organizations to meet its program goals. Inter-organizational connections were a vital feature of MentorNet since most women students in engineering and related science fields went into industry or private sector positions. Meanwhile, many of the available role models and potential mentors of the students were faculty members—academics who have had different career paths and experiences compared with their counterparts in the private sector. By being paired with e-mentors in industry, these female student-protégés could obtain access to information other than what they could obtain from available face-to-face mentors or advisors (Single, *et al.*, 2002).

Like mentoring, e-mentoring provided informational, psychosocial, and instrumental benefits to the protégés. The research also supported that two additional benefits were accrued based on leveraging electronic communications to facilitate mentoring relationships. These two additional benefits were the value of impartiality and inter-organizational connections which, in turn, supplemented the informational, psychosocial, and instrumental benefits associated with e-mentoring.

Research to Inform Programs and Program Development

Research on the impact or efficacy of programmatic features was less common than research on program outcomes. Yet, this type of research is essential to inform the development of structured e-mentoring

programs.

Model of e-mentoring

A *Model of structured e-mentoring* provided us with a framework for presenting essential features to e-mentoring programs and for discussing research findings on programmatic features. The *Model of structured e-mentoring* includes three phases and can be viewed in Figure 1. The three phases are planning, program structure, and assessment. The planning phase includes recruiting, managing expectations of the participants, and matching e-mentoring pairs. The program structure phase includes the steps taken while the e-mentoring program is being conducted, which includes training, coaching, and group e-mentoring opportunities that foster involvement in the e-mentoring process. Whatever programs can do to keep participants involved will be beneficial, as involvement (operationalized as frequency and duration of e-mentoring interactions) was the one variable consistently related to positive e-mentoring outcomes (Bennett, *et al.*, 1998; Ithaca Evaluation Group, 1999; Asgari & O'Neill, 2004).

The final element of the *Model of structured e-mentoring* is assessment. Assessment focuses on research and evaluation, whether the program elements were effective and whether the program had met its goals. The assessment phase provides evidence to internal stakeholders (such as program staff and administrators) and external stakeholders (such as funders and participants) of the value of the program and its features, and serves an important function in supporting program sustainability. For the purposes of this review of research, we focused on the Program Structure phase of the *Model of structured e-mentoring*.

Training: research findings

Training is a common feature of mentoring programs: face-to-face mentoring programs often provided training for mentors. Frameworks for mentoring emphasized the importance of providing training for mentors and, more recently, for protégés (Gaskill, 1993; Ensher & Murphy, 1997; Zachary, 2000). Training often took the form of face-to-face orientations that coincided with the commencement of the program.

E-mentoring practitioners and researchers built on the centrality of training for face-to-face mentoring programs and developed e-training for their programs. As part of the Telementoring Young Women Project, Bennett, *et al.* (1998a) addressed

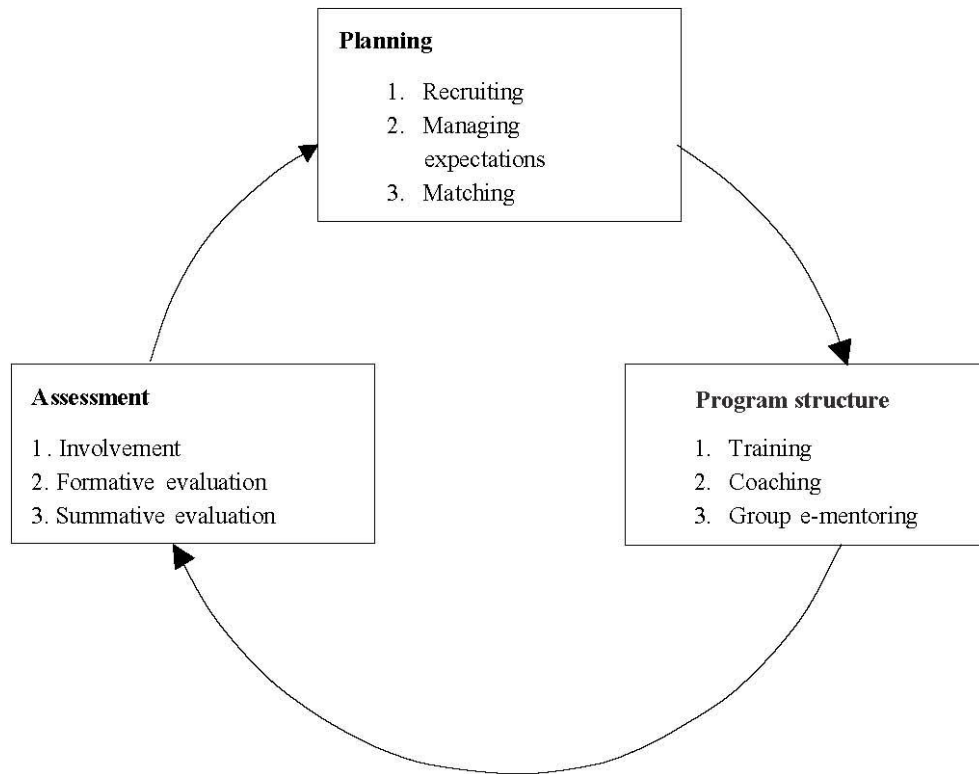


Figure 1. Model of structured e-mentoring

training through a process they called ‘online preparation sessions’. These sessions were customized to meet the needs of all the participants in the e-mentoring program. Therefore, there were separate training sessions for mentors, protégés, and project coaches.

This form of training consisted of grouping 15–20 participants on an electronic discussion list. Each discussion list included a trainer who facilitated the electronic discussion lists. In a highly structured format and for the duration of three weeks, the participants were presented with scenarios and information that would aid the development of e-mentoring relationships. The participants were asked to provide responses to scenarios that would help them support involvement in the program.

This training model leveraged the advantages of email by creating a training area that could be accessed and responded to ‘anywhere, anytime’. The groups needed to be small enough to engage all the potential mentors and protégés. This model of training delivery had advantages, in that the trainers were assigned to each electronic discussion list, and therefore could provide customized and as needed facilitation. A disadvantage of this model was its lack of scalability. Electronic list training relied heavily on experienced facilitators to moderate. Based on this, for larger e-mentoring programs, recruiting and training, and perhaps compensating, a suitable number of facilitators would be challenging.

Another format made greater use of the World Wide Web in delivering on-line training, but traded off the value of customized facilitation (Kasprisin, *et al.*, 2003). This format used interactive web-based modules to train protégés and mentors. In this format, case studies appropriate to the participants and program goals were written, separated into multiple scenarios, and posted on a web site. At the end of each scenario, two options were presented and the participants were prompted to choose one of the two options. The participants also provided their own responses to the scenarios by typing into a text box and, in turn, could read the responses of others— much like one would read through a threaded discussion. Then a web page was launched that provided annotation for their option choice. The participants continued through the case study until all the

scenarios were completed.

The interactive web-based training model eliminated the need for facilitators, therefore scalability was enhanced. It allowed the participants to respond to the case study ‘anytime, anywhere’. In addition, it allowed for multiple cases to be developed, based on the issues appropriate to the participants. Since it was static, however, it did not have the advantage of having a trainer responding individually to questions or concerns posted by the participants. Even taking into account the limitations, web-based e-training was efficacious. An experiment supported that mandated e-training for protégés enhanced the e-mentoring experience for the protégés (Kasprisin *et al.*, 2003) and for the mentors (Kasprisin, 2003). These are the only studies we know of that used experimental methods to test the efficacy of e-training for e-mentoring programs.

The Electronic Emissary Project achieved the purposes of training without developing a separate program feature. The e-mentoring pairs were assigned coaches who supported the pairs for the duration of the program, including the initial stages of the relationships, and served to get the e-mentoring pairs off to a good start (Harris & Figg, 2000). Since the focus of the Electronic Emissary Project was to provide subject-matter support for K-12 students who were working on school projects, each project was unique, and therefore, the coaches had to customize their facilitation for each pair. Harris and Figg (2000) referred to this aspect of the role of the coach as ‘facilitator as tour guide’ (p. 230). In the role of facilitator as tour guide, the coaches or facilitators helped to identify feasible projects, set up schedules and deadlines, and aid the initial coordination among protégés and mentors.

Training was a common feature of structured mentoring programs and has become increasingly common in e-mentoring programs. While e-mentoring programs implemented training differently, all the variations on training served to get the e-mentoring relationships off to a good start.

Coaching: research findings

Coaching does not refer to the support that mentors provided to protégés during the e-mentoring relationship. Coaching refers to the support that the structured e-mentoring programs provide to the participants throughout the duration of the program, not only at the beginning. Coaching is the second element of Program Structure, as can be seen in the *Model of structured e-mentoring* (see Figure 1). The literature on e-mentoring referred to this feature as either coaching or as facilitation.

Coaching does not seem to have become as widely used in mentoring programs, compared with training. Based on the elements of e-mentoring that makes it easy for participants to sign up and not follow-through, e-mentoring programs have routinely identified coaching as an important programmatic feature.

The Electronic Emissary Project relied on coaches to facilitate the e-mentoring relationships (Harris, *et al.*, 1997). After the initial phase, when the coaches served as trainers, the coaches supported the e-mentoring programs by modeling effective use of, and helping establish standards for, electronic communications. Harris and Figg (2000) identified the different roles served by the coach. One such identified role was that of ‘tutor’ and another role was that of ‘jovial nag’ (p. 230). This type of intensive and customized coaching was necessary to maintain the e-mentoring relationships of the protégés, who were school children, with their e-mentors, who were professionals.

For MentorNet, coaching served an important role as part of the program structure. Based on the program size, coaching needed to be as scalable as possible—in one year MentorNet paired about 3000 protégés with e-mentors (MentorNet, 2004). As such, it achieved this by sending out to all the participants regularly scheduled bulk email messages, which included educational and motivational information (Single & Muller, 2001). The messages were customized by the educational level of the protégés, so the e-mentoring pairs received discussion topics informed by the protégés’ academic attainment and the time of the school year. With each message, the coaches requested the participants to contact them if the e-mentoring relationships had waned. Since the protégés were college students, they were better able to manage their e-mentoring relationships with less intensive coaching.

For both these programs, coaching served multiple purposes. First, the coaches or the coaching messages

provided reminders to stay in contact. If the email exchanges have been disrupted, then this reminder served to reconnect the e-mentoring partners. Second, the coaching delivered information to help guide the e-mentoring relationship through the developmental stages of mentoring. Third, the coaching messages were either customized for the program goals and participants, or for the individual e-mentoring pairs. Therefore, coaching provided timely and appropriate topics and information that fostered involvement in the e-mentoring processes. Fourth, coaching allowed the program staff to maintain contact with the participants, and allowed a venue through which the program staff provided consultation, troubleshooting, or re-matching, as necessary.

While no studies we found compared instances of coaching versus no-coaching in an e-mentoring environment, research has supported that more frequent (weekly) coaching messages were more effective than less frequent (bi-weekly) coaching messages. Using an experimental design methodology, Single, *et al.* (2000) randomly assigned a group of e-mentoring partners to a condition where they received weekly coaching messages. A comparison group received bi-weekly coaching messages. The protégés who received more frequent (weekly) coaching messages had higher ratings of satisfaction with the program, compared with the protégés who received the less frequent (bi-weekly) coaching messages.

While the training and coaching features of e-mentoring programs supported involvement within the mentoring dyads, the next feature, namely group e-mentoring, facilitated group mentoring relationships among all the participants.

Group e-mentoring: research findings

As can be seen in Figure 1, the *Model of structured e-mentoring* listed group e-mentoring as the third aspect of Program Structure. While the e-mentoring programs reviewed here focused on programs primarily of e-mentoring dyads, some programs also provided opportunities for group e-mentoring.

In addition to the e-mentoring dyads, group e-mentoring allowed the participants to benefit from the wisdom and encouragement of others. Group e-mentoring allowed participants to develop a greater affiliation with the program or organization as a whole, not only with their e-mentoring partners (Single & Muller, 2001). When dyadic e-mentoring relationships did not meet the needs of the participants, group e-mentoring provided a safety net and allowed participants to ‘listen in’ and learn from other mentors and protégés (O’Neill, in press). Group e-mentoring activities allowed mentors to interact with other mentors, and allowed mentors to learn new ways to support their e-mentoring relationships and to develop peer e-mentoring relationships among themselves (Single, *et al.*, 2000). These findings support that a multifaceted approach to e-mentoring may be the most advantageous.

To work well, group e-mentoring required its own form of facilitation. Research on group e-mentoring identified variables associated with the electronic lists (e-lists) that composed the group e-mentoring feature (Single, *et al.*, 2000). These variables were:

1. 1. *Topic-based*: group e-mentoring that was based on discussion themes was more likely to emerge into e-communities than e-lists that were based on participant characteristics.
2. 2. *Critical mass of participants*: the e-lists that drew a critical mass of participants were more likely to last through the whole program, while those with smaller numbers fizzled out. As such, programs should be prudent in the number of e-lists they sponsor.
3. 3. *Facilitation*: like one-on-one e-mentoring, group e-mentoring needed facilitation, which could either be informal or formal and performed either by participants or by the program staff.
4. 4. *Simultaneous discussion threads*: group e-mentoring lists that emerged into e-communities evolved to the point where various simultaneous discussion threads were active.
5. 5. *Safe and supportive*: group e-mentoring was widely used and successful when the participants perceived the e-lists as safe and supportive communities, where they could expose their concerns and opinions. Flaming and inappropriate responses were not tolerated by the participants.

Discussion and implications for e-mentoring program development

Discussion

In this article, we first presented a brief history of the E-mentoring, or Telementoring, movement and noted the e-mentoring is not a panacea, neither is it an inexpensive alternative to mentoring. E-mentoring needs to be considered when face-to-face mentoring is not practical. Researchers and practitioners agree that e-mentoring is not meant to replace mentoring, but when protégés could not interact with mentors via any other means, then leveraging electronic communications as the medium for interaction provided the benefits of mentoring when these benefits would otherwise go unrecognized.

Organizations that consider e-mentoring as an easy way to offer mentoring programs are mistaken. Much like the earliest suggestions that educational technology would reduce the resources required to deliver college courses, colleges, universities, and faculty members quickly realized that this was not the case. Faculty members reported spending more time on distance learning courses (courses delivered over the Internet), compared with face-to-face courses (National Science Foundation Division of Science Resources Statistics, 2002). The more widely accepted face-to-face modes of teaching prevailed. Yet, in some instances, the Internet provided greater access to higher education; tribal colleges have successfully used distance education to expand the opportunities to higher education (Carr, 2000).

As e-mentoring expands, we encourage practitioners and researchers to be cognizant of narrowing, not widening, the digital divide. The digital divide is defined as ‘a home computing gap between White and affluent Americans and those who are ethnic minorities or poor’ (National Science Foundation Division of Science Resources Statistics, 2000, p. 2). While many middle- and upper-class school children have access to computers in their homes, this does not hold true for school children in Black, Hispanic, and low-income households (US Department of Commerce, 2000). Therefore such populations would neither have ready access to, nor experience using, technology. When providing e-mentoring opportunities to populations without ready access to technology, the programs will need to invest more resources in hardware and on training.

E-mentoring programs need not limit themselves to reliance on text-only communications. Although scheduling and geographical differences may limit the majority of the communications to email, face-to-face meetings, telephone calls, video conferencing, and other means of supporting the e-mentoring relationships can be very advantageous (National Mentoring Center, 2002). Likewise, it seems that traditional mentoring programs have utilized email to maintain contact in between the face-to-face meeting times (Brainard & Ailes-Sengers, 1994). Eventually we predict that hybrid mentoring programs, which leverage all types of communications media and opportunities, will be the most common form of formalized mentoring programs.

We reviewed the five benefits associated with e-mentoring: the informational, psychosocial, instrumental, and instrumental; the value of impartiality; and inter-organizational connections. The last two were facilitated primarily through the reliance on electronic communications for conducting mentoring relationships. The value of impartiality and inter-organizational connections were not additional benefits, but were characteristic to e-mentoring and facilitated the development of the informational, psychosocial, and instrumental benefits associated with all types of mentoring.

E-mentoring programs should not only focus on the transmittal of informational benefits. Through the programmatic features, mentors and protégés could be trained and coached to enhance self-esteem building, risk-taking ventures, and networking skills of the protégés. The value of impartiality fosters these benefits, but with less negative consequences than when mentors and protégés share organizational affiliation. The protégés can try out new ideas, share concerns, and express doubts to their e-mentors, but because of the separation in organizational affiliation, the results have the potential to have fewer negative consequences. The benefit of inter-organizational connections allows protégés to learn how to network and to obtain information outside of their already established communities. Inter-organizational connections are especially advantageous to groups already hindered by fewer opportunities, privileges, and resources; underprivileged and underrepresented groups have smaller networks and access to informal information exchanges (Blaisdell, 1995; Haring, 1997). Inter-organizational connections increase opportunities for informational, psychosocial, and instrumental benefits and leverage the ‘strength of weak ties’.

Implications for program development

The findings presented have implications for the implementation of e-mentoring programs. E-mentoring programs require the development of web sites and programmatic features that can be accessed via the Internet. Based on the cost of IT resources required to set up these features, e-mentoring is a resource-intensive venture. Decisions based on where to allocate precious resources need to be made based on the program audience and the program goals. Investing in training would be more important for populations less facile with electronic communications. Coaching should be considered when computer savvy, but very busy, populations are involved.

E-training helps the e-mentoring relationships get off to a good start. E-training for e-mentoring can be delivered in various ways. In this review, the two programs that offered the most intensive forms of training also were supporting protégés who were school-aged students. The Telementoring for Young Women Project and the Electronic Emissary Project both provided intensive training, either through offering e-lists with facilitators that had small group sizes or by assigning coaches to the e-mentoring pairs. Since these protégés are school-aged students, the programs invested resources up-front to make sure that the e-mentoring partners established strong foundations, on which the relationship could be developed further. The less intensive but more scalable version for delivering e-training, interactive web-based modules, was used with a program where the protégés were college students in STEM, and therefore more experienced with technology and less in need of such intensive training. The skills and needs of the audience for the e-mentoring program determine which methods of e-training would be most effective.

Coaching, the ongoing support provided by the program to the participants, is an important, but often overlooked, aspect of structured e-mentoring programs. Accordingly, it can be the most resource-intensive feature. As with training, the program audience influences the implementation of and need for coaching. Groups that are higher in self-direction and comfort with technology may do well with regularly delivered email messages, which provide reinforcement for the pairs to stay in contact and also suggest topic suggestions for educational value. The coaching messages can be customized for subgroups within the e-mentoring programs, but do not need to be customized for each e-mentoring pair. The coaching messages should always inquire about the involvement of the e-mentoring pairs and offer assistance, if the participants so desire. Another rendition of coaching occurs when assigned coaches guide e-mentoring partners through the whole scope of their relationships, from identifying shared projects to monitoring the relationships and jumping in with suggestions or gentle reminders. Yet, even with the best support in place, not all e-mentoring relationships will be successful. Therefore keeping the lines of communication opened between the program participants and the program staff are important, as it allows for the program staff to rematch partners when possible, or bring relationships to a mutually beneficial close when necessary.

Group e-mentoring provides additional opportunities for mentoring, exchanging information, peer mentoring, and group support. This feature provides a safety net when the e-mentoring pairs are floundering, disperses information to the program participants, and allows the mentors to engage in peer mentoring. There will be a core number of people who will participate in the group e-mentoring, a number who will lurk (read the postings to the e-lists but not respond), and a number who will choose not to participate.

Of the programmatic features presented, this feature is the least resource intensive. A coach or facilitator could oversee multiple e-lists at one time. If resources are extremely limited, offering group e-mentoring is a way to expand e-mentoring opportunities. Yet, it is also most likely to provide additional benefits to those already savvy in technology, mentoring, and networking. Those most in need of assistance will not participate in, and therefore will not benefit from, this feature.

Training, coaching, and group e-mentoring are effective, yet these features are resource intensive because they require additional personnel time and IT resources to arrange. This is a concern because mentoring and e-mentoring programs are often conducted on lean budgets (too often, in our opinion). While we have identified these features as useful and important, we put them forth as suggestions for program developers to identify and choose which features would provide the best investment based on their program goals, participants, and available resources.

Our goal with this review was that it would be useful to practitioners and researchers alike—to assist them as they develop new programs and new programs of research. By facilitating the understanding of previously conducted research, we endeavor to support the future development of e-mentoring, structured e-mentoring programs, and the field of e-mentoring.

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Note

1. This report did not address children in American Indian or Native American homes, although we can infer that these households would also have lower rates of Internet access and computer ownership in the home compared with white and affluent homes.

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