

## CHAPTER 2

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# MENTORING AND THE TECHNOLOGY REVOLUTION

## How Face-To-Face Mentoring Sets the Stage for E-Mentoring

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### ABSTRACT

The technology revolution influenced all aspects of modern life—including mentoring. Out of this revolution emerged e-mentoring, a means for leveraging electronic communications to provide mentoring opportunities to wider and more diverse groups of people. When e-mentoring began, there was no blueprint to lead the way for program developers and researchers. Yet, a strong foundation of research in the field of face-to-face mentoring paved the way for the e-mentoring field to develop quickly. In this book chapter, we identify new benefits facilitated by e-mentoring, and then identify how research on face-to-face mentoring programs has influenced the identification of these benefits. The two primary benefits are the value of impartiality and the value of interorganizational connections. These benefits complement the informational, psychosocial, and instrumental benefits enjoyed by

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protégés in both face-to-face and e-mentoring programs. Also, programmatic features deemed efficacious from the face-to-face mentoring movement have paved the way for e-mentoring programs to embrace structured formats. E-mentoring has successfully utilized training, coaching, and group e-mentoring. E-mentoring doesn't replace face-to-face mentoring, but extends it. The intent of this book chapter is to look at the history linking the two movements and to inform program developers and researchers about the research and developments that already exist in the field.

The technology revolution changed the landscape of business and commerce virtually overnight. Previous to the 1985 launch of America On-Line and the 1994 launch of Netscape, the Internet was used mainly by researchers and scientists associated with universities, colleges, and national laboratories. When companies offering email and user-friendly Web browsers went public, the Internet became accessible to the general public.

The technology revolution not only had implications for commerce and research communities, but also for the public sector. Pioneers in the field of e-mentoring envisioned how the increased connectedness brought about by the Internet could be used to facilitate social equity and educational attainment. E-mentoring programs with these goals began to develop in 1993, with the Electronic Emissary Project (Harris, Rotenberg, & O'Bryan, 1997). In 1994, both the Telementoring Young Women in Engineering and Computing Project and the pilot project for the International Telementor Project were launched (Bennett, Tsikalas, Hupert, Meade, & Honey, 1998; Neils, 1997). In 1995, MentorNet was being piloted as an e-mentoring program for women college students in science and engineering (Muller, 1997). While these are not the only e-mentoring projects developed at this time, they are the largest and provided some of the foundational research for the field (Single & Single, forthcoming).

While these programs were being developed, there was no blue print to rely on, nor lessons learned to incorporate, while developing e-mentoring programs. These programs forged new models, all based on their program goals, participants, and available resources. And yet, these e-mentoring programs did not develop in a vacuum. Decades of mentoring research preceded the developed of the e-mentoring field.

This chapter reviews and presents the research on e-mentoring outcomes and programmatic features. Throughout, we illustrate how research on face-to-face mentoring programs set the stage for developing e-mentoring programs, although we focus primarily on the outcomes associated with structured (and therefore formal) e-mentoring programs. Also, we review the research conducted on the features of structured e-mentoring programs that are effective in supporting e-mentoring relationships: e-training; e-coaching; and group e-mentoring. But first, we provide a brief history of the e-mentoring movement.

## HISTORY OF THE E-MENTORING MOVEMENT

The Electronic Emissary Project, founded in 1993, was the first large-scale e-mentoring program. The focus of the program was to support public school children in their science and science-related projects — projects for which their teachers may not have the necessary subject-matter expertise. Therefore, the Electronic Emissary electronically connected school children, who served as the protégés, with scientists, who served as the mentors, to assist the children in science-related school projects (Harris et al., 1997). This project served an area of national need, as the scientific capabilities of the nation's school children were of concern.

The Telementoring Young Women in Engineering and Computing Project (The Telementoring Project) was developed in 1994 and was funded by a grant from the National Science Foundation (Bennett et al., 1998). The Telementoring Project focused on gender equity in technology and sought to determine whether e-mentoring would be efficacious in encouraging and supporting female high school students in their use of and interest in computers by pairing them with female professionals in technology. This project was designed to address social equity issues, as women are underrepresented in computing and information technology (IT).

Other e-mentoring programs quickly followed. Two large-scale programs (i.e., programs which served over 1,000 participants) that focused on e-mentoring dyads were the HP Telementoring Program, which later became the International Telementoring Program (International Telementor Program, 2003; Neils, 1997), and the Dartmouth E-mentoring Program for Women in Science and Engineering, which developed into MentorNet (MentorNet, 2004; Muller, 1997). The International Telementoring Program provided additional support to thousands of public school children, with the intent of supporting educational projects that they were working on in the classroom. Most of the mentors, based on the companies participating in International Telementoring Program, came from the high-tech fields, so many students were matched with IT workers and scientists.

Both MentorNet and its pilot project addressed the underrepresentation of women in science, technology, engineering, and mathematics (STEM). The Dartmouth E-mentoring Project, the pilot project for MentorNet, provided a mechanism for matching women students in STEM attending a geographically isolated college with women scientists and engineers (Muller, 1997). MentorNet went national, and then international, as it provided opportunities for women students in STEM fields to be paired with either male or female professionals in those fields (MentorNet, 2004).

These early programs shared similar goals: to provide mentoring for school children, adolescents, and college students, where face-to-face mentoring would be infeasible. Also, these programs all sought to address some issue of national need – be it the lack of scientific literacy of America’s school children or the underrepresentation of women in STEM fields. These pioneering programs also identified components that were necessary for the successful implementation of e-mentoring programs, which included easy access to technology for all participants (Bennett, Hupert, Tsikalas, Meade, & Honey, 1998; Harris & Figg, 2000) and various forms of facilitation to support the establishment and continuation of e-mentoring interactions (Single & Single, forthcoming).

The program developers of these programs realized that it was not enough to recruit and match protégés and mentors. In those instances, many times the e-mentoring relationships often fizzled out. Rather, these programs determined early on that e-mentoring was not a simple endeavor, but was a resource-intensive endeavor that required IT expertise and the provision of on-going participant support (Harris et al., 1997; O’Neill, Wagner, & Gomez, 1996; Single & Muller, 2001). The program developers realized that they would need to rely on some of the programmatic features embraced by the face-to-face mentoring movement, such as training, coaching, and opportunities for group mentoring (Boyle & Boice, 1998b). Early on the e-mentoring program began implementing structured e-mentoring.

### **DEFINITION OF STRUCTURED E-MENTORING PROGRAMS**

As part of this effort, early scholars found the need to define structured e-mentoring in order to distinguish it from naturally occurring e-mentoring. This definition also distinguishes it from formal e-mentoring programs that do not provide programmatic facilitation to the participants. Below is the first definition we know of that appeared in the literature on 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 informed by the work of the face-to-face structured mentoring field. The importance of program structure in developing and implementing successful mentoring programs is well known (Boyle & Boice,

1998b; Wunsch, 1994). In particular, this definition highlights the importance of training and coaching as important features of structured e-mentoring programs and the importance of assessing e-mentoring programs.

### **BENEFITS ASSOCIATED WITH E-MENTORING**

Ultimately, mentoring and e-mentoring provide customized personal or professional support to protégés. While the benefits to mentors and e-mentors have been identified, often the goal of programs is to provide benefits to protégés. While early in the e-mentoring movement there were concerns over the efficacy of building mentoring relationships online, recent research has determined that e-mentoring confers the same benefits afforded to protégés in face-to-face mentoring relationships. The informational, psychosocial, and instrumental benefits associated with face-to-face mentoring (Single, 2004), are mirrored in the benefits associated with e-mentoring (Lewis, 2002; Single, Cunningham, Single, Neptôn, & Kirk, 2002). Generally, informational benefits refer to the benefits afforded by gaining information or knowledge that is advantageous to the protégés; psychosocial benefits refer to the motivational and psychological boosts that occur when e-mentoring results in the protégés experiencing increased confidence; and instrumental benefits refer to the way mentoring often evolves into sponsorship, with the mentors providing opportunities that promote their protégés and provide them with opportunities for increased visibility and advancement. In addition, research on e-mentoring has identified two extra benefits that are accentuated by relationships developed in cyberspace: the value of impartiality and interorganizational connections.

#### **The Benefit of the Value of Impartiality**

The value of impartiality refers to the benefit associated with being mentored by someone who has no a vested interest in your choices or ulterior motives for mentoring. Research on face-to-face mentoring programs has revealed the drawbacks of having invested mentors and the advantages of having impartial mentors. For instance, Boyle and Boice (1998b) reported on two face-to-face structured mentoring programs within university settings, one of which focused on new faculty, the other on graduate students. In the program for new faculty, the researchers originally planned to implement the traditional mentoring model and attempted to pair new faculty members with senior faculty members within the same departments. Based on the hiring history, however, they found that this was sim-

ply impossible. Because of these limitations, new faculty members were paired with senior faculty members in other departments and sometimes with administrators.

At the end of the program, the mentoring dyads paired across departments reported higher rates 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 and Boice, 1998b, p. 173). Based on this serendipitous revelation, Boyle and Boice (1998b) were able to identify the value of protégés being paired with impartial mentors.

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

In the second of the two studies, research on a large-scale mentoring program supported this finding regarding the value of impartial mentors (Single, Muller, Cunningham, Single, & Carlsen, 2005). This program paired women students in engineering and science with male and female mentors in industry. By definition and design, all the protégés and mentors were affiliated with different organizations. The women protégés, often in rigorous academic programs and experiencing great pressure from family members and academic advisors, greatly appreciated the value of having a mentor who was an impartial advisor. This was someone who did not have a vested interest in the protégés' decisions nor were the mentors in positions of judgment or assessment over the protégés. Repeatedly, the protégés expressed this as a great benefit of the program. Below are two quotes representative of the protégés' appreciation of the value of having impartial mentors:

[Protégé A] 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.

[Protégé B] I had someone to write to when I was stressed who was not going to judge me by what I said or how I felt. (Single et al., 2005, p. 8)

The benefit of the value of impartiality allowed the e-mentoring relationships to develop to the point where there was great trust and openness within the e-mentoring pairs.

A colleague and friend, Anne Chen, brought to my attention (P.B.S.) that the value of impartiality may actually counterbalance the psychosocial benefits. She expressed her concerns by writing in an email, “The theme of impartiality was an intriguing one because I often think of mentors as being cheerleaders and being emotionally validating. How do you reconcile this with this idea of impartiality?” (personal communication, December 7, 2004).

I agree. We do want mentors to be cheerleaders and to be emotionally validating to their protégés, but if mentors hold dual roles in relationship to their protégés, the mentors may also sometimes experience dual reactions. This is not the fault of the mentors, rather the result of power differential when mentors and protégés who are working together are in an advisor-advisee relationship or, more generally, the mentors are in a position authority over their protégés. In these instances, research has supported the idea that the protégés are less free to share self-doubts, ask “silly questions,” or voice concerns about their decisions to mentors who may have a say in their future affiliation with the organization or community.

This exchange between Anne and myself, which occurred within an informal e-mentoring relationship, allowed me to clarify my thinking regarding impartiality and psychosocial benefits. It also provided an example of the benefits of impartiality. Anne Chen is a doctoral student in Education at Stanford. We have exchanged ideas and writings throughout a few years. Since I am more senior than her, by default I fall into the “mentor” role – and yet I always find her feedback valuable. I hope she finds my feedback valuable as well. Because I am not on her dissertation committee, and am not in a position of authority over her, we can have some very frank and meaningful professional exchanges. I greatly appreciate our e-mentoring relationship. And I appreciate the benefit of impartiality, for it seems to benefit not only the protégés but also the mentors.

### **The Benefit of Interorganizational Connections**

Interorganizational connections refer to the expansion in the protégés’ networks due to being mentored or e-mentored by someone outside of their already established networks. In one of the earliest studies on mentoring, Kram (1983) researched face-to-face mentoring relationships in the business setting. In many instances, the mentors also served as the supervisor or boss of the protégés. This may be positive, but if these are the protégés’ only mentor, then it limits the protégés’ access to information. Any opportunities to which the protégés’ supervisors would be privy, so would the protégés, as they move in the same network and would thus have access to the same information.

When two strong networks overlap, even a little, a new channel of communication and information flow occurs, allowing persons in both networks to benefit. Granovetter (1973) coined a term for this and referred to it as the “the strength of weak ties”.

E-mentoring facilitates the “strength of weak ties.” Since electronic communications span render geographical distances irrelevant, e-mentoring can connect protégés with mentors in other organizations much more readily than if only relying on face-to-face mentoring. E-mentoring programs can break down geographical and organizational barriers for one-on-one (Single & Muller, 2001) and group and peer mentoring (Russell & Perris, 2003; Single, Muller, Cunningham, & Single, 2000). In other words, e-mentoring facilitates interorganizational connections.

Interorganizational connections allow protégés to obtain information and knowledge from mentors who can be connected using electronic communications, but who otherwise would not share the protégés networks. An advantage of weak ties, according to Granovetter 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).

Large-scale e-mentoring programs have facilitated the value of interorganizational connections. One such program is MentorNet. MentorNet matches female science, technology, engineering, and mathematics students with female and male professionals working in non-academic settings. Most women students in engineering and related science fields go into industry or private-sector positions. Meanwhile, many of the role models and potential mentors these students have on campus are faculty members – academics who may have very different career paths and experiences compared with their counterparts in the private sector. While the faculty members can be supportive of the students, the information they can provide is primarily about academic jobs. By being paired with e-mentors in industry, these female student-protégés could, as stated by Granovetter, gain access to more diverse sources of information than are available to them on campus. Below are two quotes from protégés expressing their appreciation for the benefits of interorganizational connections:

[Protégé A] I had someone to encourage me through the rough weeks, give me an idea about what I am working so hard for, and to give me new ideas about what I can do now to get ready for the future.

[Protégé B] I found it to be most helpful the duties my mentor had at her job. [My field] is so broad, it was good to hear some specifics. It also helped me to learn which classes my mentor actually USED on the job (Single et al., 2005 p. 9).

While the first student expressed receiving psychosocial benefits (i.e., being encouraged) and the second student expressed receiving informational benefits (i.e., information about what course materials will be used in her later career), the receipt of these benefits were facilitated through the benefits of interorganizational connections. These inter-organizational connections were made possible by their participation in a structured e-mentoring program.

In sum, while e-mentoring does not create new benefits associated with mentoring, the nature of e-mentoring does allow for protégés to experience enhanced benefits associated with e-mentoring. These two benefits are the benefit of the value of impartiality and the benefit of inter-organizational connections.

Increasing and enhancing benefits for protégés (and mentors) is a central purpose of e-mentoring programs. Although, features associated with structured e-mentoring programs can influence directly the success of the program and the benefits experiences by the participants. Next we examined the programmatic features of structured e-mentoring programs that are efficacious in enhancing program success and participant benefits.

### **PROGRAMMATIC FEATURES AND HOW MENTORING INFORMED E-MENTORING**

While most research on e-mentoring has focused on identifying the outcomes, there has been a body of research that examines the influence of programmatic features on the outcomes of the programs. This research is important for the field as it identifies for us where programs and program developers should invest their resources in order to increase the effectiveness of e-mentoring programs. In this section, we present a model of e-mentoring and then report on the research examining the programmatic features of training, coaching, and group e-mentoring.

#### **Model of E-mentoring**

Single and Single (forthcoming) developed a model of e-mentoring, building on the earlier work of Boyle and Boice (1998b) and Single and Muller (2001), whose research on face-to-face mentoring and e-mentoring, respectively, informed the development of the model.

As can be seen in Figure 2.1, the model of structured e-mentoring includes three phases: planning, program structure, and assessment. The planning phase includes developing program goals, recruiting, and managing the expectations of the participants, in addition to the process of

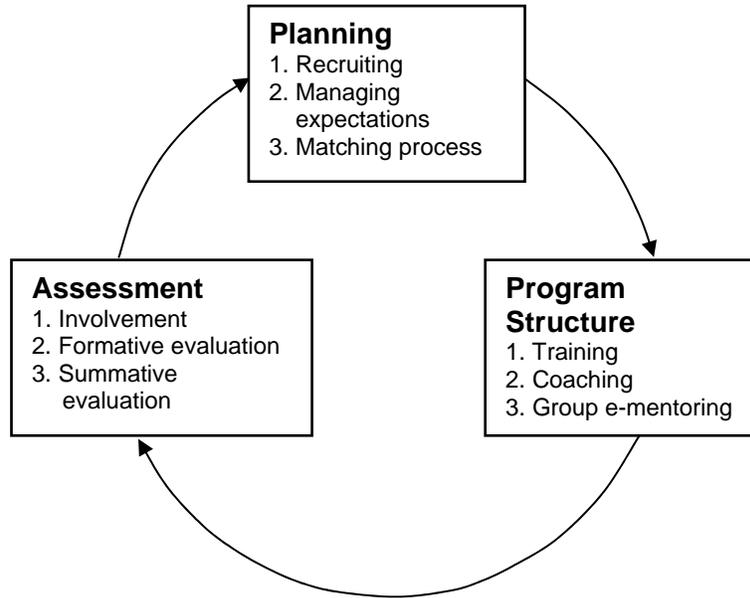


Figure 2.1. Model of structured e-mentoring

matching mentors and protégés. The program structure phase, which we are focusing on in this chapter, includes facilitated training, coaching, and group e-mentoring that allows for the participants to get and stay engaged in the e-mentoring process. Why is program structure so important? Because in numerous e-mentoring year-end evaluations, the one variable that was repeatedly associated with positive outcomes for both the mentors and the protégés was the frequency and duration of the one-on-one mail interactions (Asgari & O'Neill, 2004; Bennett et al., 1998; Single et al., 2002). Therefore, when an e-mentoring program can facilitate the frequent and regular e-mail exchanges among the participants, the program will be more successful.

Assessment is the final element of the model of structured e-mentoring. Assessment includes collecting and analyzing involvement data, formative data, and summative data. Involvement data includes collecting information on the frequency and duration of exchanges between the e-mentors and protégés. Collecting and analyzing formative data guide the alteration or enhancement of a program; the main audience for formative analyses is the program staff (Herman, Morris, & Fitz-Gibbon, 1987). The internal stakeholders would be most concerned with the results of the formative evaluation.

The final form of assessment, collecting and analyzing summative data, is especially important in the current climate of educational accountability. The summative evaluation portion of the assessment phase addresses the questions of “What is the impact of the program?” and “What is the value

of the program?” Summative evaluation provides evidence to both the internal stakeholders (program staff and administrators) and external stakeholders (funders and participants) about the programs’ efficacy and value. The efforts put into assessment can serve an important function in program sustainability. When programs can demonstrate their effectiveness and their impact, they are in much better positions to negotiate with funders and stakeholders for continued funding.

While assessment is a vitally important part of any e-mentoring program, due to length constraints for the remainder of the chapter we will focus on the program structure feature of the model of e-mentoring: training, coaching, and group e-mentoring.

## **Training**

Getting off to a good start is important in face-to-face mentoring (Boyle & Boice, 1998a), and the same holds true for e-mentoring. The purpose of mentoring training is to prepare the participants, equipping them with the skills they will need to establish and develop a healthy and satisfying mentoring relationship. This has generally focused on the mentors, but recently training for protégés has also begun to be conducted (Ensher & Murphy, 1997; Gaskill, 1993; Zachary, 2000). Training occurs at the beginning of a program and brings the participants together for group interaction and training.

When setting up a structured e-mentoring program, the question arises of how to deliver group-training sessions using electronic communications. The Telementoring Young Women Project modified group face-to-face training to suit the electronic environment by developing “online preparation sessions” (Bennett et al., 1998). They provided training for both the mentors and for the protégés. For the mentor training, the program developers assigned groups of 15 to 20 mentors to electronic discussion lists. A trainer was assigned to each list, facilitating the discussion and presenting scenarios and information to the list. The mentors were asked to react to the scenarios and information, much as they would react to a protégé. These online preparation sessions lasted for 3 weeks.

This project also provided online preparation sessions for the protégés. Protégé training consisted of providing another set of electronic discussion lists that the protégés could use to interact with one another. The trainers in these online preparation sessions directed the protégés to prepare for their e-mentoring relationships by engaging in tasks such as writing brief biographies, which could be shared with future mentors.

The online preparation sessions built on the research of the mentoring movement and created group training experiences that were both interact-

tive and engaging. The online preparation sessions provided the advantage of allowing participants to join in “anytime, anywhere,” simply requiring a computer and access to the Internet. The Telementoring Young Women Project focused on mentor training, since the mentors were adults who were e-mentoring high school-aged girls and so the adult mentors were largely responsible for guiding the e-mentoring relationship. The emphasis on training generally differs based on the populations being served by the e-mentoring programs.

This model of e-mentoring training has two disadvantages. First, it is dependent on the availability of a substantial number of experienced trainers to moderate and reinforce the engagement in the online preparation session. Second, based on this requirement, it seems that with larger e-mentoring programs, engaging an appropriate number of facilitators could be difficult. For instance, if the electronic discussion list format was used for both mentor and protégé training, and the program included 150 mentors and 150 protégés, then a program would require a minimum of 20 online preparation lists, and therefore 20 trainers.

Interactive Web-based training was another format used for delivering training to e-mentoring participants (Kasprisin, Single, Single, & Muller, 2003). The researchers found that this format more effectively leveraged the World Wide Web to deliver training, but sacrificed customized facilitation in the process. Web pages, rather than e-lists, were the primary medium for delivering the training. Case studies were written appropriate for the participants in the e-mentoring program. Each case study was divided up into multiple scenarios, and at the end of each scenario a question or decision was posed for the e-mentoring participants. The participants then choose one of two answers or options, after which a Web page with an annotated response highlighting the pros and cons of their decisions was loaded onto the screen. The participants could then “interact” with the Web-based training by adding their comments into a text box, and reading the comments of the other participants, much like a threaded discussion.

Since it was posted directly to the World Wide Web, the interactive Web-based training model enhanced scalability, with no limit to the number of participants who could read and interact with the training at the same time. The need to recruit facilitators for online training sessions was eliminated. In addition, it allowed for multiple case studies to be developed, based on the developmental levels and issues appropriate to the participants, or subgroups of participants, engaging in the e-mentoring program.

To test the efficacy of interactive Web-based training, Kasprisin and colleagues (2003) conducted an experiment to test the hypothesis that mandating training for protégés would enhance their e-mentoring experience.

In this instance, the protégés were adults (college-age women studying engineering and science) and the mentors were professionals in science or technology careers, and the program was protective of their time and involvement.

Half of the protégés were randomly assigned to the experimental group and were required to complete the on-line training in order to participate in the program. The other half of the protégé group was randomly assigned to the control group, for whom completing the on-line training was optional. Comparative analysis of the year-end results supported the hypothesis that the protégés who were mandated to complete the training had higher engagement in the e-mentoring program (Kasprisin et al., 2003). This is one of the few experimental studies that tested the efficacy of training for e-mentoring programs.

Mandating on-line training for the protégés appeared to enhance the protégés' ability to engage in and maintain their e-mentoring relationships. In addition, a follow-up study suggested that the mentors also benefited. When they were paired with protégés who had been through the online training, at program end the mentors reported experiencing greater engagement and satisfaction in the e-mentoring process (Kasprisin, Single, Single, & Muller, 2005).

While training is a popular feature of mentoring programs, and sometimes e-mentoring programs, the features are rarely tested using a rigorous experimental design. While year-end evaluations allow the participants to rate their perceptions of the training, and this certainly is valuable, utilizing an experimental design methodology can go one step further, allowing researchers to make inferences about the efficacy of the feature. Why is this important? Since both mentoring and e-mentoring programs are often run on tight budgets, additional program supports, such as training, are costly in terms of financial and human resources. If a program feature is going to have durability, then we recommend that there be assurances that the feature is efficacious and provides more positive outcomes than if the feature were not implemented.

As mentioned earlier, training is a popular feature of structured mentoring programs and becoming increasingly popular in e-mentoring programs. Next, we'll present a less popular but perhaps more effective program feature, coaching. While training typically occurs at the beginning, coaching occurs throughout.

## **Coaching**

Coaching occurs throughout the program, and consists of regular facilitation provided by the program staff to the participants. In this context,

coaching does not refer to the interactions that occur within the e-mentoring relationships, although coaching certainly does occur there as well. According to Single and Muller (2001), “coaching, in a networked environment, is delivered via email messages containing discussion suggestions or mentoring tips that are appropriate for the program goals and population” (p. 115). Coaching serves four purposes. First, the messages provide reinforcements and serve as reminders to the protégés and e-mentors to stay in contact. Also, the messages from the coach deliver information to help guide the e-mentoring relationship through initiation, cultivation, separation, and redefinition (Kram, 1983), the developmental stages of mentoring. Next, the coaching messages provide discussion topics or suggestions for shared activities for the e-mentoring pairs, which may be customized for the program goals and participants. When the e-mentoring pairs don’t have something immediate to discuss, then these provide points for connection. Fourth and finally, the regular coaching messages sent from the program staff serve as a way for the program to stay in contact with the participants, and provide services such as consultation, troubleshooting, or rematching, as necessary (Single & Muller, 2001).

Coaching originated directly as a result of research conducted on face-to-face mentoring programs. As part of a university based mentoring program, Boyle and Boice (1998b) contacted the participants weekly in order to collect data about their on-going experiences and this practice proved to be serendipitous. An analysis of the data suggested that this regular contact served to motivate and encourage the participants to stay engaged with the mentoring program. Boyle and Boice reported that the mentors and protégés stated the “good-humored suspicion” that the regular contacts for data collection purposes were really meant to ensure that the participants met regularly. As one participant suspected: “When I’m tempted to not meet or fill out my things [mentoring journal and checklist], I realize it would be easier to do them than to have to explain to you why I didn’t when you call” (p. 166).

From these findings, Single and Muller (2001) conceived the notion of using coaching in a structured e-mentoring program, and delivered the coaching via regularly scheduled email messages. Coaching messages relating to the same topic were sent to the mentors and the protégés simultaneously, therefore suggesting common discussion topics. In addition, they reported that developing different coaching curriculum for each of the different groups involved in the program allowed them to customize the program to the different stages of the participants (e.g., first- and second- year undergraduate students and their e-mentors received different messages than doctoral students and their e-mentors).

Research supports the hypothesis that more frequent (weekly) coaching messages were more effective than less frequent (biweekly) coaching mes-

sages; using an experimental design methodology, Single, Muller, and Carlsen (2000) randomly assigned a group of e-mentoring partners to a condition where they received weekly coaching messages. A comparison group was assigned to receive biweekly 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 (biweekly) coaching messages. Unfortunately, we know of no studies that have compared instances of coaching versus no-coaching in an e-mentoring setting, although we do recommend this for future research.

Coaching, the on-going structure and support provided by the program to the participants, is an important but often overlooked aspect of structured e-mentoring programs. However, it can also be the most resource intensive feature. Research with participants in face-to-face mentoring programs suggests that coaching keeps the participants involved and engaged in the program. Research on a structured e-mentoring program suggests that more frequent coaching is efficacious in increasing the satisfaction of the protégés (Single, Muller, & Carlsen, 2000).

While the training and coaching features of e-mentoring programs primarily support involvement within the mentoring dyads, the next feature – group e-mentoring – facilitates group mentoring relationships among all the participants.

### **Group E-mentoring**

The third aspect of program structure identified by the model of e-mentoring is group e-mentoring. As with the previous features, this program feature was founded on research conducted in face-to-face mentoring settings. As part of their university based mentoring programs for new faculty and new graduate students, Boyle and Boice set up monthly group meeting for all the program participants, both mentors and protégés. According to the participants, this turned out to be the “best part” of the program:

Group meetings provided the participants with a sense of campus involvement they did not find in their own departments, especially around the topic of teaching. The meetings fostered openness in sharing experiences, even some which were embarrassing, and in providing possible solutions to problems. Also, it allowed mentors to observe (and subsequently attempt) alternative styles of mentoring. Thus they broadened their roles as coaches and models (1998b, p. 176).

While face-to-face mentoring programs can foster affiliation with the shared organization, due to the fact that participants are often recruited

from a common organization, e-mentoring programs can foster affiliation with the program, or with the field.

As part of their research on MentorNet, Single, Muller, Cunningham and Single (2000) investigated a group of program-sponsored electronic discussion lists (e-lists). From an examination of 13 e-lists and by relying on a mix of qualitative and quantitative methods, they identified the variables associated with the e-lists that endured through the whole program and emerged into opportunities for group e-mentoring. Below are some of the variables associated with the emergent e-communities:

1. *Topic-based e-lists*: Group e-mentoring was more likely to emerge in the e-lists that were based on discussion themes (such as issues around job searching and balancing personal and professional time) rather than on participant characteristics (such as, the field of chemistry or educational level of the protégés).
2. *Critical mass of participants*: Group e-mentoring was fostered when the e-lists attracted a critical mass of participants. The e-lists with smaller numbers fizzled out within the first few weeks of the program. This suggests that programs should be judicious in the number of e-lists they sponsor and it should be based on the number of participants in the program.
3. *Facilitation*: The e-lists that evolved into group e-mentoring all shared one characteristic: one of the participants had taken on the role of the informal facilitator. This person regularly “seeded” the e-list with items from either current events or their own experiences in order to keep the discussion going. This facilitation can either be informal or formal and performed either by participants or by program staff members.
4. *Simultaneous discussion threads*: Group e-mentoring occurred when the e-lists fostered and maintained a few simultaneous discussion threads – so that participants could pick and choose to join discussions that were relevant to their needs.
5. *Safe and supportive*: When the participants perceived the e-lists as safe and supportive, then group e-mentoring occurred. No flaming or inappropriate messages were posted to these e-lists. Of note is that the e-lists that evolved into group e-mentoring “prompted, embraced, and validated opposing opinions or perspectives” (p. 125).

Another notable aspect of the e-communities was that they provided opportunities for the mentors to develop peer-mentoring relationships among themselves. So, much like their counterparts who participated in the face-to-face group meetings, these e-mentors were able not only to

learn from one another how best to develop and foster their e-mentoring relationships, but also to share information, support, and opportunities among themselves.

## **SUGGESTIONS FOR FUTURE RESEARCH**

While there are various directions that future research into e-mentoring could take, we present two that in our opinion are of the highest priority and could have the largest impact, as in spite of their importance the literature is largely silent on these topics.

### **Assessing Outcomes**

To the credit of the field, many e-mentoring programs conduct year-end evaluations that request the participants to rate their experiences with the program. These evaluations often include both quantitative and qualitative methods and use the self-assessments of the participants as the results (Lewis, 2002; Single et al., 2002). The next step in identifying the results of e-mentoring programs is to conduct comparative analysis – comparing the skills, knowledge, self-confidence, and developmental paths of the participants in the structured e-mentoring programs versus a similar control group that did not participate in the e-mentoring program. This would allow for interpretations to be made that speak to the results of the e-mentoring intervention.

For this assessment to occur, it would require the identification of an experimental group, which would engage in the e-mentoring, and a control group, which would not. These groups would need to be similar to ensure that the inferences made about any differences between the groups would not be due to selection bias. One way this can occur is through the development of a multiphase structured e-mentoring program, where increasing numbers of participants are included each year. Then, a wait-listed control group could be set up (Cook & Campbell, 1979), allowing the control group in the first year to be included in the program for a future year. At the conclusion of the program, the skills, self-confidence, and commitment to staying in a profession or field can be assessed. If differences exist between the experimental and the control groups, then the differences are likely to be due to the intervention of the structured e-mentoring program.

### **Examining the Efficacy of Coaching**

Coaching has been identified as an important part of supporting involvement and engagement in structured e-mentoring programs (Single & Muller, 2001; Single et al., 2000). However, coaching can be the most resource-intensive aspect of programs. While it is known to be an important part of conducting a structured e-mentoring program, additional research could provide more insights into the efficacy of coaching.

Research has indicated that the delivery of more frequent coaching messages is more beneficial than less frequent coaching messages (Single et al., 2000), but there is still a need for research that examines conditions of no-coaching versus coaching. In fact, we recommend that were this study to be conducted, three comparison groups be identified: (1) a control group that receives no coaching message, (2) an experimental group that receives weekly coaching messages and, (3) a second experimental group that receives biweekly coaching messages. Then, the participants could be assessed at the conclusion of the program and any differences in the results could be attributed to the coaching and/or differences in intensity of the coaching received.

The results of this research would provide a great deal of useful information, enhancing our knowledge about the efficacy of coaching. Coaching has great potential to increase the engagement, benefits, and satisfaction possible through an e-mentoring experience – a goal with which all practitioners, researchers, and participants would certainly support.

### **IMPLICATIONS FOR E-MENTORING PROGRAM DEVELOPMENT**

In this review of the research, we identified five aspects of e-mentoring that are noteworthy. The first two identified aspects of e-mentoring that facilitate the positive outcomes widely associated with mentoring, namely the benefit of the value of impartiality and the benefit of interorganizational connections. While these two aspects are not additional benefits, they are aspects fostered by e-mentoring that facilitate the development of the informational, psychosocial, and instrumental benefits associated with all types of mentoring.

In addition, we identified three features of structured e-mentoring programs that are efficacious. These features, however, are resource intensive, requiring additional personnel time either intensively to develop the features such as for the training, or throughout the program, such as the coaching feature. In addition, mentoring and e-mentoring are often, too often in our opinion, conducted on a lean budget. So, while we have identified these

features as being both useful and important, we put them forth as suggestions only to allow individual programs to identify and select the features that would provide the best investment based on their program goals and participants.

Our goal with this book chapter was that it would be useful to practitioners and researchers alike – to assist them as they develop new programs and new areas of research. By facilitating the understanding of previously conducted research and closing any gaps in knowledge, we hope to support the future development of e-mentoring, structured e-mentoring programs, and the field of e-mentoring.

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