

A challenge for educators is to develop, apply, and evaluate learning strategies that promote the acquisition of *desired skills* such as critical thinking, problem solving,

Telementoring Using E-mail: The Classroom to Co-op Connection¹

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Abstract

Educators in cooperative education programs are challenged to select teaching strategies that integrate classroom and co-op experiences. The purpose of this qualitative study was to describe the experiences of physical therapist students participating in a telementoring program. Thirty-three senior classroom students served as mentors for 22 underclassman on co-op. Underclassman used e-mail to communicate with their mentors about physical therapy practice and the workplace. Data were gathered over six months from three sources: e-mail correspondence, student journals, and interviews. Results demonstrate that telementoring provided students with opportunities for reflection on learning and promoted an integration of co-op and classroom experiences.

interdisciplinary cooperation, effective communication (Wilson, Stull, & Vinsonhaler, 1996), self-directed learning, and information literacy in their students. For schools of cooperative education, selected teaching strategies should also foster an integration of classroom and cooperative education (co-op) learning experiences. One strategy for accomplishing integrated student learning is by establishing a formal mentoring program between classroom and co-op students using e-mail technology. The intent of this article is to describe the impact that an electronic telementoring program entitled the Classroom to Co-op Connection Program had on student learning. The participants in this telementoring program were 33 college-aged senior physical therapist students in the classroom who served as mentors to 22 underclassmen (mentees) on co-op.

For the purposes of this work, the terms labeled *desired skills* are

defined as follows:

- Critical thinking refers to a purposeful, reflective, reasoned approach to problem solving.
- Problem solving involves the ability to examine a problem from more than one perspective. The problem solving process may result in more than one appropriate response and can involve brainstorming with others.
- Interdisciplinary cooperation is defined as the ability to work collaboratively with peers of different disciplines.
- Effective communication refers to both written and verbal abilities to articulate clearly and accurately.
- Information literacy pertains to student comfort and proficiency with e-mail, the web and word processing technology.

The mentoring process is a concept familiar to cooperative education programs. Mentor relationships between students and employers are encouraged and nurtured through co-op experiences. Mentoring relationships may also develop within academic settings. Ricks and Van Gyn (1997) maintain that for schools of cooperative education, mentoring relationships are evident in both school and work environments and provide opportunities for enhancing student learning. However, a challenge for educators is to devise classroom strategies that capitalize on this learning opportunity.

For the purpose of this research, a mentor is defined as a knowledgeable source who guides a less experienced individual in a supportive fashion (Anforth, 1992;

Atkins & Williams, 1995; Gibson & Angel, 1993; Hackworth, 1987). Mentoring relationships may be either natural or planned. Natural mentoring relationships develop through friendships or collegial associations. Conversely, planned mentoring occurs through structured programs in which mentors and mentees are matched through a formal procedure (Atkins & Williams, 1995). Moreover, mentoring programs typically fall into three categories: educational or academic, career mentoring, and personal development mentoring (Atkins & Williams, 1995). The Classroom to Co-op Connection Program (CCCP) represents planned mentoring and is a combination of all three categories of mentoring programs.

There are many benefits of mentoring that may be realized by both the mentor and the mentee. Researchers in diverse fields have documented the positive effect of mentors. However, according to Ricks, Jameson, and Rose (1993), research performed in the fields of business, education and psychology has traditionally emphasized factors such as career and academic success, mentor roles, and mentor/mentee characteristics rather than describing the development and nature of the mentor relationship. Professionals in the nursing discipline have examined the impact of mentoring on nursing student learning from several different perspectives (Cahill & Kelly, 1989; Hayes & Harrell, 1994; Porter, 1995; Spouse, 1996). Similar to researchers in the field of business, education and psychology, Cahill and Kelly (1989) maintain that mentoring is a learning experience that promotes augmented career success — especially in women who have traditionally been without professional mentors — and promotes professional development in the adult mentor. Researchers in nursing have also examined the impact that mentoring has on student learning. Spouse (1996) demonstrated that mentorship in nurse training programs results in student-centered learning, while Porter (1995) found mentoring to serve as a method for creating a community of dialog about practice.

A major benefit of the mentoring relationship is that it encourages discussion and provides an opportunity for self-reflection on perplexing issues

such as decisions related to the complexity of practice. Schon (1983) identified reflection as a tool required for promoting professional development. He proposed that professional practice could be enhanced if novices were allowed opportunities to reflect on their professional actions instead of relying solely on their acquired technical knowledge (Schon, 1983; 1987). Schon (1983) believes that reflection can expose tacit understandings of practice that have emerged around repetitive work experiences and can assist a novice with making sense of uncertain or unique situations. The Classroom to Co-op Connection Program utilized several methods for stimulating reflection: journal writing, e-mail conversations, and classroom dialogue. Reflection combined with experiential learning opportunities, such as co-op, promotes professional development that is self-directed and personally relevant for the student.

According to O'Neill, Wagner, and Gomez (1996), telementoring refers to "the use of e-mail or computer conferencing systems to support a mentoring relationship when a face-to-face relationship would be impractical" (p.39). Telementoring has been found to provide students with greater access to knowledgeable practitioners who can provide timely advice about complex or sensitive work or intellectual problems. This in turn minimizes repeat mistakes and increases student learning because students are made aware of problems and encouraged to make timely changes in their professional behavior. In addition, electronic communication, due to its informal nature, allows for rapport to build more readily between a mentor and a mentee (Anforth, 1992). Telementoring is being used in business and education to connect the workplace with the classroom (Bellinger, 1997; Mather, 1997; O'Neill et al., 1996). For example, Hewlett-Packard employees who have volunteered to be mentors are using e-mail to connect with elementary students in schools. A goal of the Hewlett-Packard program is to assist students in making connections between what they are studying and the real world (Bellinger, 1997; Mather, 1997). A goal of the CCCP was to allow physical therapist students on co-op and in the classroom

to share in a learning dialogue about the complexities of practice. In this program, students are mentoring each other as younger peers on co-op provided dilemmas for classroom seniors to discuss collectively, reflect upon, and prepare suggestions for future action.

The purpose of this research was to document student experiences with an electronic mentoring system and describe the impact this system had on student learning. To do this, the following research questions were established: 1) What will be the content of reflection stimulated by a tele-mentoring program, and what will be the impact perceived by students on learning? 2) Will student learning stimulated by a telementoring system be perceived differently by the mentor and mentee?

Methodology

Sample

Fifty-five physical therapist undergraduate students from a large American university volunteered to participate in the investigation. Of the 55 students, 33 were seniors who served as mentors to 22 underclassmen. At the time of the study, the 33 mentors were enrolled in school while the 22 mentees were on co-op. Prior to data collection, subjects were informed of the research purpose and provided with informed consent forms approved by the University's Office of Institutional Research.

Mentees

Using a purposeful sampling technique (Bogdan & Biklen, 1992), the cooperative education department identified 22 physical therapist students on co-op: nine sophomores (10% of the sophomore class of 90 students), seven middlers (6% of the middler class of 119 students), and six juniors (6% of the junior class of 100 students) who served as mentees. The co-op students were selected to represent the three-underclassman academic years and a diversity of work placement settings including hospital acute care, outpatient hospital clinic, for-profit rehabilitation clinic, inpatient rehabilitation facility, VA hospital, and state hospitals for the blind and mentally retarded. Freshman students were excluded from the study because they do not

participate in the co-op program until their sophomore year. Mentees were not offered any incentive for their participation.

Mentors

The 33 senior physical therapist students (31% of the senior class of 107), who served as mentors, were enrolled in a course entitled PTH 1420: Physical Therapist in the Healthcare System. This seminar course met one time per week for three hours and was taught by the primary investigator. Class topics included issues of managed care, health care reform, multiculturalism, and international health care system comparisons. For the seniors, their participation (e-mail correspondence and journal entries) in the research project accounted for 15 percent of their grade in PTH1420. Senior students were given the option to have their journal and e-mail entries excluded from the final data set, yet none exercised this option.

The 22 co-op students (mentees) were randomly paired with the 33 senior physical therapist students enrolled in PTH1420. Of the 22 mentor/mentee pairings 11 were one-on-one, and 11 pairings involved two mentors to one co-op student. The reason for the two to one pairings resulted from having a greater number of classroom (33) compared to co-op (22) student participants.

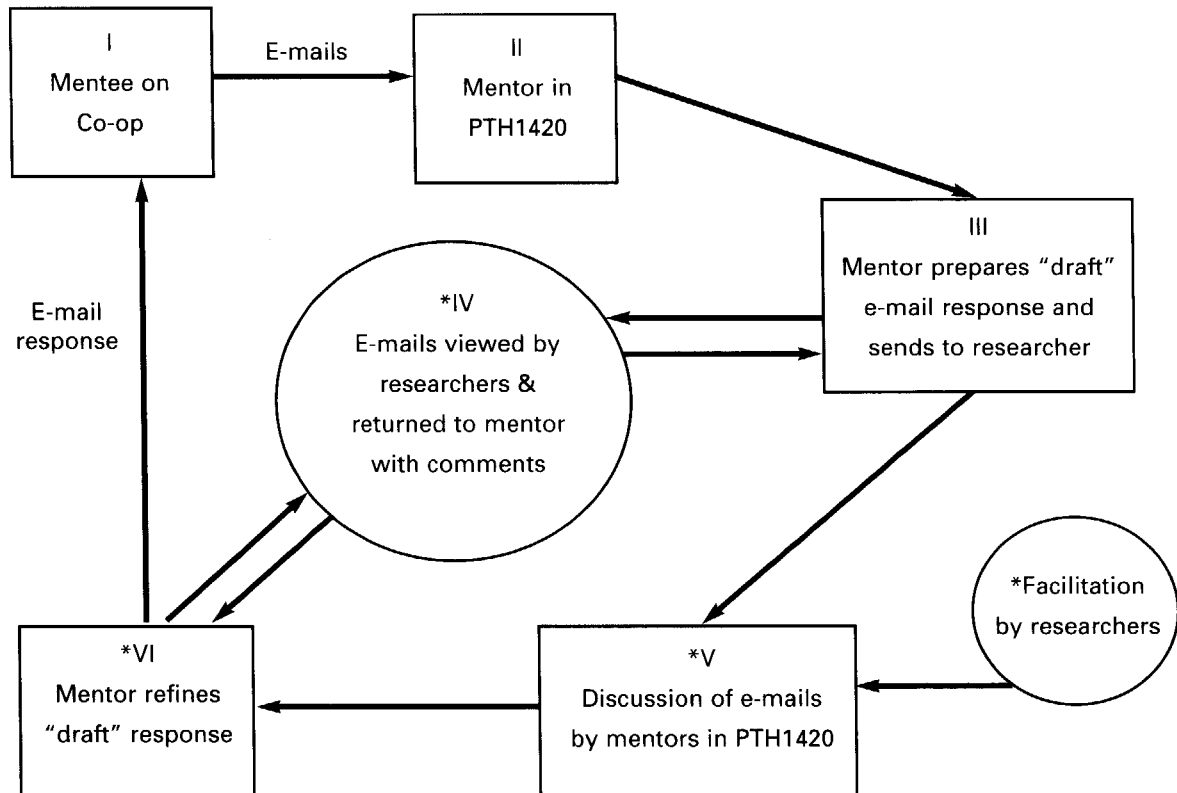
Design

This investigation was completed using a qualitative, single-site case study methodology. Data from three sources (e-mail, journals, and pre- and post-program interviews) were collected over two three-month quarter time periods.

Procedures

The CCCP provided three potential mentoring opportunities for participants: 1) group mentoring between senior student mentors; 2) researcher to senior student mentor; and 3) senior student mentor to co-op student mentee. The following is a description of the telementoring communication process (see Figure 1). The telementoring process was initiated when a mentee on co-op communicated via e-mail with an appointed classroom men-

Figure 1
Telementoring communication process



* represents a mentoring opportunity

tor. Mentees used e-mail to communicate weekly with their mentors regarding relevant issues of physical therapy practice and the world of work. The mentors then prepared "draft" e-mail responses that addressed the concerns voiced by their mentees. Before responding to a mentee, mentors forwarded both their mentee's original e-mail and the prepared "draft" response to one of the researchers for review and comment. The mentors were also instructed by the researchers to bring their mentee e-mails and prepared "draft" responses to the PTH1420 class. During the first hour of the PTH1420 seminar, mentors presented relevant practice concerns mentioned in their mentee's e-mails to the entire class. Then, the mentors discussed mentee concerns

and problem-solved collectively to further develop and refine the "draft" e-mail responses. It was during the class discussion that mentors engaged in a group mentoring process. Although three distinct opportunities for mentoring were available, as illustrated in Figure 1, the process was interconnected as final e-mail responses from mentors to mentees often reflected input from the mentor, PTH1420 class, and facilitators.

The PTH 1420 seminar discussion was facilitated by one of the four researchers: one academic faculty who was also the primary investigator, one co-op faculty, and two physical therapist graduate students. In preparation for the seminar discussions, each researcher had reviewed the content of the

e-mail correspondence and was familiar with the issues voiced by the mentees and “draft” solutions prepared by the mentors. The researchers served to either initiate or focus the class discussion and occasionally shared personal knowledge and perspectives on difficult issues when appropriate. The information provided to seniors by the researchers represented a second mentoring opportunity for the students.

Based on the PTH1420 classroom discussion, the senior mentees refined their “draft” e-mail responses. Finally, before mentor e-mail responses were returned to mentees they were reviewed by one of the researchers to ensure clarity, accuracy, and appropriateness of responses. The final e-mail communication that transpired between the classroom senior and co-op underclassmen represented a third incidence of mentoring.

Data Collection

Data were collected from both co-op and classroom students using three different methods. These methods included paper copies of student e-mail correspondence, reflective journal entries, and eight pre- and post-program interviews. These three sources of data provided the researchers with multiple perspectives on the mentor-mentee process and relationship and served as a method of triangulation (Maxwell, 1996).

Reflective journal entries were completed weekly by both the co-op and senior physical therapist students and followed specific formats (Appendices A and B). Eight interviews were conducted by the graduate students with four co-op students (2 sophomores, 1 middler, and 1 junior) and four senior physical therapist students. The interviews were designed to gather additional information specific to participant experiences with the e-mail program. These interviews occurred at two points during the study: pre- and post-program intervention. The researchers developed open-ended interview questions based on the research questions and from personal experience with the e-mail program (Appendices C and D). All interviews were conducted by the graduate students and were audio taped and later transcribed verbatim.

Data Analysis

Focus on analyzing qualitative data emanates from the research questions that were created at the beginning of the study. Content analysis is a process of identifying, coding, and categorizing the principle patterns within the data (Miles & Huberman, 1994). Copies of student e-mail correspondences, journal entries, and interviews were distributed to all researchers for their review. Preliminary categories emerged inductively and were organized by all researchers during the data analysis process (Maxwell, 1996). A predetermined coding category was not imposed on the data by the researchers. Coding categories began as descriptive, then progressed to pattern codes that served as the study’s final themes (Miles & Huberman, 1994).

Using the aforementioned system, all of the researchers inspected and analyzed the three sources of data: e-mail correspondence, journal entries, and pre- and post-program interviews. To generate initial descriptive codes, all of the researchers examined the content of the student e-mails, journals, and interviews to look for predominate patterns that emerged inductively from the data. The researchers later collapsed these descriptive codes into four final themes based on the trends noted within the data.

Triangulation involves using multiple methods of data collection and/or multiple investigators and serves as a strategy for increasing internal validity and reducing researcher bias (Maxwell, 1996). Student journals and interviews provided a source of triangulation for the e-mail data. For example, the topic of sexual harassment on the job arose in student e-mails and was discussed by both sets of students in their journals. During a post-program interview, the researchers could ask for clarification or more information about what had transpired in the workplace regarding this issue. Having all researchers examine the data served to confirm, refute, or clarify each person’s observations about the developing patterns and themes within the data. Multiple perspectives on the data prevented a single investigator from dominating the data analysis process.

Limitations

Several barriers were encountered during this work that may impede the process of a telementoring system. These barriers included non- or poor response from mentees, technical problems with the e-mail system, time constraints, impersonal nature of e-mail, and confidentiality of student responses. In the current study, four of the 33 mentors experienced major difficulty receiving responses from their mentees. However, due to the volume of data received from other mentor-mentee pairs (18 to 20 e-mail correspondences per mentor/mentee pairings) this loss of data was insignificant. However, this situation did result in frustration for the four mentors. To assist the four mentors deal with mentor non- or poor response, the PTH 1420 class brainstormed and provided suggestions for facilitating communication. For example, the class suggested that the mentors send an e-mail message to their mentee that was probing and asked for specific information such as inquiring directly about what a mentee believed his strengths and weakness were for the co-op and if he could provide an example.

The impersonal nature of e-mail was a concern for several of our mentors. One strategy the researchers used to address this concern involved organizing a pizza party as a thank you for all participants. This gathering was scheduled for the end of the research process and provided an opportunity for mentorship pairings to meet one another in person. Two proposed strategies to manage this issue during future research efforts include a pre-research gathering to introduce mentorship pairs and placing pictures of mentorship pairings on a course website.

To address the issue of student confidentiality and appropriateness of e-mail responses, two steps were taken upfront by the researchers. First, seniors were instructed not to disclose the name of student mentee during the PTH 1405 class discussion of mentee e-mails. During the six-month study duration, only one problematic incidence of a breach in student confidentiality occurred.

A second issue concerned whether or not mentor e-mail responses to their mentees were written

appropriately and contained accurate information. Therefore, before mentor e-mail responses were returned to mentees all correspondence was screened by one of the researchers to ensure clarity, accuracy, and appropriateness of responses. If a mentor response was deemed to be inappropriate, suggestions for change with respect to content or rewording were provided by the researchers via e-mail. Only when the mentor made the suggested changes were they allowed to send the e-mail to the mentee.

Results

Four major themes were identified from the data: 1) practice concerns; 2) value of co-op experience; 3) reflection; and 4) learning. Each theme will be defined and excerpts from journal entries, e-mail correspondences, and/or student interviews will be provided which support the results in each section. The use of multiple data sources to document different perspectives on the same phenomena serves as a method of triangulation (Maxwell, 1996).

Practice Concerns

This theme contains ethical or practice issues noticed by the mentee while working on co-op that are related to the practice of physical therapy. Co-op student e-mail correspondence with their mentors provided the content for this theme. Our results indicated that an issue affecting every co-op student in the sample concerned how to deal with patient illness or death. Often co-op students communicated that they felt alone and without a mechanism for addressing this difficult experience. As a result, many of the co-op students inquired of their mentors about strategies for coping with extreme sickness or loss. Mentors often shared their experiences and in turn related their insight to the feelings and situations articulated by the co-op student. One mentor in particular relayed a sympathetic response that acknowledged the normalcy of her mentee's feelings. This dialogue is illustrated below:

This has been a sad week because one of our patients, who is the sweetest thing, was hospitalized and isn't in too good of a condition, so I feel bad for her. I like to think that I develop

nice casual relationships with all of the patients I work with, so it makes it sort of hard when I know that one of my favorites is not in good condition. She's survived a lot though already, being treated for cervical cancer, and she's an inspiration." [Sophomore mentee e-mail]

Most of my experience thus far has been in pediatrics and it's horrible to have to witness children and young adults battle disease. Several 'close' patients to me have died and I still think about them on occasion. Although I was their 'therapist,' they helped me and taught me things just as much as I helped and taught them things. The most important thing that they taught me, is just how valuable and short life can be...it makes me appreciate how lucky I have been in life...Although most of the sickness and death I have encountered has been with children, it does not mean that the sickness or death of an elderly patient is less painful. What you should be proud of is that you were given the opportunity to make that individual's time on this world a little more pleasant. You had the power to make that individual laugh and smile. You are lucky to have met and spent time with a woman who was obviously a source of inspiration for you. She must be feeling like her world is spiraling out of control. Again, you have the power to show her that she is no less of a person despite her illness." [Mentor e-mail response to the sophomore mentee]

In this example, the mentor responded in a manner that provided comfort and advice for the mentee during a difficult time. The mentor also provided insight on the situation for how the mentee might learn and grow from her experience.

Value of Co-op

This theme contains data that support the benefits of hands-on experience while on co-op as mentioned or realized by the mentees. Co-op student e-mail correspondence with their mentors provided the content for this theme. Student journals contained additional information regarding how

mentees thought about their work experiences. Results demonstrated that for the mentees, co-op afforded the opportunity to apply classroom knowledge to real world experiences, self-assess strengths and weaknesses, provide opportunities for appreciating likes and dislikes related to career choices, and experience first hand the changeable world of work. However, one of the most interesting data trends involved job adjustment issues. The following quote from a sophomore mentee journal documents the difficulty she experienced with the transition to employee and beginning the hands-on portion of physical therapy:

Well my first week of co-op is over, and it went by so fast. So much happened this week, and it was all so exciting, scary and strange...The first day was very stressful for me. I was bombarded with all sorts of new information, new people (their names and departments), and a huge building that I would eventually learn my way around...I was slapped with many responsibilities all at once, the largest of which was my own patient load. I would be seeing these people on my own with no direct supervision, and I would be starting with six [patients]. My patients are very, very old people, so at first I was afraid to touch them because they looked as if they would break...The issue of death was plaguing my mind a lot this week. I think this is one of the things that I didn't expect from this job. I know the residents were old, but I didn't think it would affect me so much. I wrote to my co-op connection correspondent about the issue, and her response really helped out..." [Sophomore student journal entry]

During the post-program interviews, interviewees were queried about challenges that were noted while making the transition from classroom to co-op and if the telementoring program assisted in any way. One mentor remarked during her interview that:

I know a couple of classmates had students [mentees] that had difficulty with the transition, using what they had in the class and putting it to use on co-op. Bouncing ideas off of somebody

older, a mentor, really helped them transition. 'Oh, I do know this. And, just because I am on co-op doesn't mean I can't use what I learned in class.' So I think that for a lot people it [classroom to co-op connection program] did help. And it's nice to have just a connection back to school to say, if I am having trouble, you have somebody on campus who you can contact who can contact the co-op department right away... [Mentor post-program interview]

This example illustrates that some mentees experience difficulty transitioning from the classroom to the workplace. However, both mentors and mentees maintain that a connection to school while working in the field was a useful resource for managing this transition.

Reflection

Data from e-mail conversations, journals, and post-program interviews allowed students to document their reflection on experience while participating in our telementoring program. In their journals and post-program interviews, mentors indicated that reflection was stimulated by a connection of personal past experience with the current experiences of their mentee. A major trend within the mentee data was acknowledgment of self-growth and learning. Co-op students became aware of personal growth and learning through reflection on their work experiences and communicated this information to their mentors via e-mail. The following quote is an example of his data trend:

My parents came and visited my work this past week and it was a very interesting experience. When I first came here [facility for adults with severe disabilities] for my interview they gave me a tour and I had no idea what to expect and I had no clue what the people were going to be like. I understood that they were mentally retarded and that they were deformed in many ways but I still didn't know just what to expect. The co-op that was currently there took me around to introduce me to some of the clients and she kept saying 'Oh, this is so and so and he is so cute and doesn't that look like a laugh!'

Now I walk into the rooms and see the clients, they don't really look awkward and I know from their movements and facial expressions what kind of day they are having. Well, when my parents came, I got to reverse roles and it really struck me. I would introduce my mother and father to a client and I would talk about how great the person was, what program we do together and so on. I could see the look on my parents' faces, that they were thinking the same thoughts that I had once thought about these people. It is amazing what a 180 I did. I look at a client and I can't imagine ever thinking this person isn't handsome, or cute, or happy! I think this is something everyone should do, having people to your place of work that is. I know a lot of employers don't agree, but it doesn't have to be parents, it can just be someone who has not been to the place before and you showing them around. I can't tell you how much I have learned from teaching someone else about my work. I realized that so many things seem commonplace to me, but when I think back, I have only know it for a month and a half. [Sophomore co-op student e-mail]

Mentor journals and post-program interviews contained data about the reflective process by which a mentor examined his or her past experiences in relation to the current experiences of their mentees. Mentors reflected back on their entire career as physical therapist students to date and recounted the pros and cons of their various learning experiences.

The first part of class today was spent discussing our e-mail correspondence with our co-op students. I think it's amazing that so many of us have had so many experiences and never really shared them before. We sit next to each other every day [in class], and never realize what good resources we have so close to us. I think that sharing our experiences with younger co-op students is an excellent idea. It's funny to think that we've been through almost everything they are going through. It would probably have been very helpful to me to have a sort of 'mentor' to

talk to each week about my job. Each co-op experience I had had good and bad points. At my first job, I worked with a friend and fellow PT [physical therapist] co-op, so we could discuss awkward, stressful, or scary situations together. My second co-op was very difficult, though, and I felt very isolated. I bet some older students could have really helped me through some awful situations. It's also good to get some encouragement from more experienced students, because sometimes you're uncomfortable having personal discussions with supervisors. I was very impressed with our students' [co-op] experience and maturity. While working with a terminally ill patient, she developed the sense of when to push and when to back off. I think this is one of the more difficult skills to conquer. I've often wondered if, in the course of 'motivating' patients, PTs [physical therapists] begin to harass these very sick people. I know it's our job to get them up and moving, but some people just look soooo miserable. (That's something I had to get over quickly on clinical!) So, enough about co-op. [Mentor journal entry]

In some of the situations that came up with my student it did remind me of situations that happened when I was on co-op and clinical. Actually, it kind of made me look back and realize which one I liked the best and why...[Mentor post-program interview]

Participation in a telementoring program provided several opportunities for student reflection on experience. Reflection on experience allowed many of the mentees to realize personal growth, self-growth, and learning while on co-op. For mentors, the reflective process stimulated a connection of personal past experience with the present experience of mentees.

Learning

Data that comprise this theme relate to learning achieved by either mentor or mentee that occurred through their participation in the telementoring program. All students discussed in their journals

the skills that were enhanced while involved in the telementoring program. Examples of these skills included effective communication, problem solving, self-assessment, reflection, and professionalism. An example of learning that was realized by mentors was the importance of professionalism when communicating by e-mail with their mentees. The following mentor journal excerpt illustrates this point:

In class this week, I realized that not only are our e-mail correspondents benefiting from communicating with us, but we are learning new skills also. First, we are learning to problem solve together as classmates. We rely on each other's feedback in order to respond to the issues that our e-mail student presents to us. In doing so, we are learning how to tactfully address some professional situations appropriately. This just shows how much we have grown as students, persons and health care professionals. We are also becoming aware of how to effectively communicate through writing. Feelings and tone of voice are sometimes hard to interpret through written forms of communication. E-mail requires us to be very clear in our thoughts and suggestions and to avoid any misinterpretation. [Mentor journal entry]

In this example the mentor noted that clear, concise, and accurate writing was essential for effective communication and acknowledged that her problem-solving skills were augmented through classroom discussion of mentee e-mails. In addition, she also reflected upon her growth as a professional. One benefit of journal writing is that it allowed students an opportunity for reflection on the learning that occurred through their participation in the telementoring process.

Discussion

Practice Concerns

Results of this study demonstrated that through co-op placements, physical therapy students experienced and gained an understanding for the components that comprise the practice of physical therapy. Co-op students often communicated their

practice concerns to their mentors and asked for advice for how to cope with them. An overwhelming concern for mentees involved patient illness and death. For a health care practitioner, providing comfort and advice are both components of effective mentoring (Purtillo & Haddad, 1996). Since coping with patient sickness and death was an issue that most mentors had experienced personally, they could offer assistance to their mentees.

In the classroom, a realistic way for educating students about difficult issues they may encounter during their professional careers, such as death and dying, is often not available. Our results demonstrated that though a telementoring communication process (Figure 1), a co-op student could discuss with their mentor a difficult topic that could not fully be addressed or realized from classroom instruction (Baker, McPhail, & Pfau, 1991). One manner in which a student may learn to cope with difficult situations is through personal experience. However, based on our results, it is evident that less experienced students may benefit from a mentor with whom they can share and discuss their concerns. Having a mentor with whom the mentee can express thoughts and emotions about difficult situations encountered in practice may often be a beneficial learning activity. Mentors can impart what they have learned from their previous experiences, provide the mentee with a different perspective, and assist them with coping strategies for dealing with various practice concerns. In this respect, our telementoring process served as an educational mentoring program.

Value of Co-op

The transition from school to either a first co-op or a new co-op position provided difficulty for some mentees. The progression from the classroom to the clinic is one of the most challenging experiences faced by physical therapist students (May, Morgan, Lemke, Karst, & Stone, 1995). This transition is often difficult because students must shift their thinking from that of learner to an employee or worker. Mentees often discussed with their mentors the difficulty they encountered with job transition and sought insight for how to cope with

this shift in roles.

From both the mentee and mentor responses it is evident that our telementoring program served as a support system for some students on co-op. The program was also useful for assisting individuals experiencing difficulty with the application of classroom to clinical knowledge and with job adjustment issues. One area where mentors can assist mentees is with the movement from the classroom student to employee role where they assume professional duties commensurate with their academic experience (LaBonty & Stull, 1993). Because our telementoring program assisted mentees with job adjustment concerns, it can be viewed as possessing a career-mentoring function.

Reflection

Dewey (1933, p.64) provided a definition of reflection as the "stepping back from a perplexing experience which allows one to think and generate a more comprehensive plan of activity." He also described the process of learning as continuous and grounded in experience (Dewey, 1938). Schon (1983) identified reflection, as a tool required for promoting professional development. He proposed that professional practice could be enhanced if novices were provided with opportunities to reflect on their actions rather than relying solely on their technical knowledge (Schon, 1983/1987).

Through journal writing and e-mail correspondence, mentees documented and verified problems and learning encountered during their co-op experiences. Writing slows down thinking and through journaling and e-mail discussion, co-op students were provided with a method for reflection on their experiences. This reflective process allowed the co-op students opportunities for self-assessment and for engaging in self-directed growth as professionals. According to Jensen, Gwyer, Shepard, and Hack (2000), expert practitioners utilize self-monitoring through self-assessment to gain expertise. Our results indicate that the same principle may be at work in students growing as professionals.

Participation in our telementoring program provided students with an opportunity for reflection on their growth and development through their

experience in the professional setting (Jensen & Denton, 1991). Co-op students reflected on current experiences and professional development changes. Conversely, mentors reflected on personal past experiences and used this knowledge to educate mentees about the dilemmas they faced during current experiences. By documenting their experiences, learning was made explicit. This learning may be used to either guide a student's personal future action or in the case of a mentor the subsequent action of less experienced peers.

Results from this section address research question one and demonstrate that a telementoring program provides opportunities for reflection. The content of reflection and perceived learning was different based on whether a participant was a mentor or mentee. Concomitantly, these data also support the value of our telementoring program as a personal development-mentoring program.

Learning

Our results indicated that reflection on experience was stimulated through writing in journals or via e-mail communication and that reflection was an important precedent for making learning explicit. Writing in journals allowed mentors to enhance their self-assessment skills as they reflected upon past co-op experiences and on their role as mentors. Reflection encourages students to test their knowledge base, inevitably enhancing it through the acquisition of new knowledge (Heinemann, DeFalco, Smelkinson, 1992). In some respects, our mentorship program was effective because the students discovered some aspects of themselves that were not previously considered, such as becoming effective communicators (Van Gyn & Ricks, 1997). A perceived change in communication is useful because students must develop interpersonal and written communication skills to be successful clinicians (Baker, McPhail, & Pfau, 1991). Through participation in our telementoring program, the participants were provided with opportunities to improve their written communication skills using e-mail as the communication medium.

With respect to research question two, our results demonstrated that student perception of personal

learning was facilitated by reflection on experience. Our mentors indicated that through their participation in a telementoring program they realized that they engaged in problem solving during classroom discussion of mentee e-mails and realized the necessity for effective written communication skills. Conversely, through reflection, mentees realized learning related to professional growth. These data also support the value of telementoring as a strategy for personal development mentoring.

Conclusion

Students encounter many professional issues while employed on co-op. The results of this study demonstrate that underclassmen may benefit from having a mentor with whom to voice their feelings and concerns. The mentor serves as a support system for the mentee and may provide professional advice about the complexities of practice and the work environment.

Like other mentoring systems, our telementoring program provided students with the benefit of having a greater awareness of what they were doing and a clearer understanding of their behavior (Millonzi & Reitano, 1997). For our program, reflection on experience assisted with augmented learning. What was different about our program was that it allowed senior students to mentor younger peers and learn from that experience. Our results support the notion that awareness of individual action and behavior is augmented for students through the provision of opportunities for reflection whether in the field or as a mentor.

Self-directed learning skills are enhanced when the learning model connects classroom and work in the field (Heinemann, DeFalco, & Smelkinson, 1992). Our results indicate that a telementoring process may be one learning model that accomplishes this goal and may serve as a template for other institutions with a cooperative education program. Expertise derived from research that evaluates student experiences with innovative teaching strategies can be used to improve the educational system that in turn graduates students who are competent employees.

Future research efforts could include replicating

the current telementoring program and then offering it to freshman physical therapist students. Establishment of mentorship pairings between freshmen and upperclassmen will introduce freshmen to the benefits of mentoring with technology early in the curriculum.

Additional research efforts could be directed towards devising strategies for reducing the barriers to the process: impersonal nature of e-mail, non- or poor mentee response, limited time, technology problems, and confidentiality of e-mail responses. Two proposed strategies for reducing the barriers of the impersonal nature of e-mail include a pre-research gathering to introduce mentorship pairs and possibly placing pictures of mentorship pairs on a course website.

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Appendix A
Co-op Student Reflective Journal Guiding Questions

When writing in your journal, initially you may want to think about and answer the following questions:

- 1) During the week, what experiences did I encounter that I found either, exciting, perplexing, or disturbing where I wished that I had someone with which to share my thoughts and observations? Please document the experience that you had and WHY it made you feel or think like you did at the time.
 - 2) Did having a classroom connection cause me to act or think differently with respect to experiences that I had while on coop? If so, please describe how you acted or thought differently.
 - 3) Did having a classroom contact assist me (or not assist me) in dealing with exciting, difficult, or perplexing situations that I have encountered while working on coop? Please describe HOW your contact either assisted or did not assist you and WHY.
 - 4) What might make my classroom to coop connection a better experience or more useful for me or other students while on coop?
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Appendix B
Senior Physical Therapist Student Reflective Journal Guiding Questions

Think back over the class, your group interaction, E-mail correspondence and document the following points:

- 1) An important insight you realized about your emotional responses and learning processes in relation to controversial health care issues. In other words, what are you learning and why is this occurring.
- 2) The activity that provided the most intense learning "high." What made this activity so exciting or pleasing? How did it contribute to your understanding of health care systems?
- 3) An activity that fostered an intense learning "low." What made this activity so distressing?
- 4) What was your experience with your coop student email conversation? How did your communication affect your learning in this class with respect to the world of work, health care or practice issues?

Appendix C

Pre-Program Interview Questions

Mentees Only

- 1) Where are you doing your co-op and how long have you been at your current co-op job?

All Students

- 2) How many co-op quarters have you participated in so far at Northeastern University?
What settings have your co-op experiences been in?
 - 3) What do you expect to learn from participating in the co-op to classroom connection program?
 - 4) Do you have any concerns about participating in this program? If so, please describe them.
 - 5) While on co-op (recently or in the past) can you recall any time when a classroom contact (senior physical therapist student) might have been helpful? If so, can you please provide an example?
 - 6) If you believe that a classroom contact might be useful for you can you explain why you believe this to be true?
 - 7) As you begin this program, how do you feel about being in the role of a mentee/mentor?
 - 8) How comfortable are you with the operation of a personal computer?
 - 9) For what purposes do you use your personal computer?
 - 10) How comfortable are you using e-mail and the Internet system?
 - 11) For what purposes do you use e-mail, if any? Please provide an example.
 - 12) How do you feel about communicating with a mentor/mentee using e-mail during this program? Do you have any concerns about this?
 - 13) Why did you decide to participate in this program?
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Appendix D

Post-Program Interview Questions

- 1) How many times did you communicate with your mentor or mentee?
 - If there was a lack of responses from your partner, can you provide an example of the strategies you used to address this issue?
- 2) How did you feel about communicating once a week? Was it adequate?
 - If once a week did not work well, can you suggest an adequate time frame for correspondence?
- 3) In your opinion, how valuable was the e-mail system for establishing and maintaining a mentor-mentee relationship?
 - Can you provide any examples of the positive or negative aspects of using e-mail in this program?
 - Did you have any concerns about mentoring someone via e-mail that you did not know?
- 4) Did you find it easy to communicate in writing with your e-mail partner? If so why, if not, why not?
 - Did you ever have to clarify information with your partner? What strategies did you use to clarify information?
 - How did it help with your communication? When did you need to do this?
- 5) If you didn't know your mentor or mentee before the start of the program, do you have any suggestions for getting correspondence started or making it more comfortable?
- 6) Did you find that the communication with your e-mail partner became easier throughout the quarter? If so, why? If not, why not?
 - What strategies did you use to improve communication?
- 7) Do you see the role of mentor changing as a student progresses through co-op: during the quarter? Or over the years? (looking back or ahead?)
 - How about if you mentored somebody who was a sophomore or more inexperienced?
- 8) What purpose did the journal writing serve for you during this process?
 - Did it impact your life and/or co-op experiences? If so, please describe/provide an example.
- 9) Did this program help you to reflect on your experiences in either the clinic or the classroom? If so, can you provide an example of how you used these reflective experiences?
- 10) What part of the program did you find helpful or beneficial? Why?

- Can you recall an instance when your partner's suggestions impacted your thought process or decision-making?
- 11) Can you describe some things that you learned from participating in this program?
- Did you learn anything new about clinical techniques, interpersonal skills, problem-solving or healthcare?
- 12) Do you believe that it is challenging to transition from the classroom to co-op setting? How did or do you deal with this transition?
- Did the classroom to co-op connection program assist in this process? If so, please describe.
- 13) Did this program inform you about future co-op jobs or your experiences at all? If so, please describe.
- 14) Did your original expectations of the program change as time went on? If so, please describe.
- 15) What was your favorite e-mail discussion? Please describe and tell why this was of interest to you.

Mentee questions only

- 16) At what point in your co-op was this program most helpful to you?
- 17) What tips would you give to mentors to get their co-op student to respond consistently/weekly to their e-mail correspondences?
- 18) As a mentee, did you benefit from hearing about your mentors own personal experiences? If so, why was this true for you?

Mentor questions only

- 19) What are the benefits of being a mentor? Did you grow as a professional by being a mentor? If so, please provide an example. If not, why not?
- 20) How did you find the mentor experience?
- 21) Do you feel like you were a good mentor? If so, why?
In your opinion, what were the benefits, drawbacks of being a mentor? Can you provide an example?
- 22) Did you have any fears or insecurities about being a mentor? If so, please provide an example. If not, why not?
- 23) When communicating with a mentee, do you relate your own experiences to them? If so, why? If not, why not?
- 24) What were the most valuable topics discussed in class and why? Who were they of value to?
Why did these experiences stand out in your mind? Did you have similar experiences while you were on co-op? If so, would you handle them differently now that you have discussed the issues with your peers?
- 25) What were the least valuable topics discussed and why?
- 26) If you were in a paired mentor relationship how did it go? What were some of the positive and negative aspects? If you were not in a paired mentorship would you have liked to be in one? If so, why? If not, why not?
- 27) How did you find the assistance provided by the graduate students during the program?
Was it beneficial or not?
Can you give one example of when you felt really lost and didn't know how to respond to your student?

All Participants

- 28) Is there anything you would change if you were to participate again in a program like this? Please provide an example.
- 29) Are you interested in continuing communication after the program is over? If so, why? If not, why not?