

# Telementoring in Community Nursing: a shift from dyadic to communal models of learning and professional development

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**ABSTRACT** *This article reports on a six-month telementoring initiative in a Canadian community nursing organization. The way in which Internet technologies may support and augment face-to-face mentorship of health care professionals is a relatively unexplored area of research and was the focus of this project. Participants (N = 22) were all employees of Saint Elizabeth Health Care (SEHC), a community nursing agency servicing 150,000 clients in urban and rural Ontario, Canada. Nurse mentees (n = 11) and nurse-mentors (n = 11) engaged in collaborative discourse in webKnowledge Forum, a second-generation computer-supported intentional learning environment (CSILE). Discussions among all participants were directed at collaborative learning and professional development. Results indicate that mentees contributed and read more notes than mentors and were more likely to engage in threaded discourse with peers. Readership patterns were similar for both groups. Fifty-eight per cent of all nurses reported improved asynchronous communication and problem-solving skills as a result of online collaboration. Seventy-five per cent of all respondents reported a positive professional development experience and 50% of all respondents reported improved clinical practice ability as outcomes of the telementorship program. All reported high satisfaction with the technology. It is concluded that this project facilitated a shift from dyadic mentor–mentee (preceptor–intern) training to communal opportunistic learning and professional development.*

## **Introduction**

### *From Preceptorship to Telementorship*

Preceptorships are intended to bridge the gap between academe and practice by providing novice nurse practitioners with the necessary knowledge, skills and psychomotor abilities to provide safe and effective patient care (Dunn & Hansford, 1997; Nehls *et al.*, 1997). The typical preceptorship model pairs novice practitioners with more experienced clinicians who direct novice learning and professional development. Key motivators of engagement in preceptorships of both preceptors and

interns are opportunities for reciprocal learning and professional development (Dibert & Goldenberg, 1995; Usher *et al.*, 1999). Key characteristics of effective preceptors as identified by students include the ability to role model, provide constructive criticism and foster a climate of mutual respect (Kotzabassaki *et al.*, 1997). Key elements of positive clinical learning environments for students are those in which both students and preceptors are engaged in reciprocal learning (Dunn & Hansford, 1997). Hierarchy and ritual have been identified as impediments to learning, while shared control and democratization of the power differential between preceptors and interns results in better student learning outcomes and patient care (Öhring & Hallberg, 2000).

The study reported in this article sought to shift from didactic and dyadic models of mentorship to a communal telementorship model of professional development. Telementorship is defined as the use of 'telecommunications technology (including e-mail, conferencing systems, or telephones) to develop and sustain mentoring relationships where face-to-face ones would be impractical' (O'Neill *et al.*, 2000). Whereas in conventional settings nurse interns are restricted to the tutelage and opinions of only their assigned preceptor, a telementorship model may establish community and offer a diversified knowledge exchange between all participants in the online environment, independent of time and place.

The history of telementoring in education spans nearly two decades (Hackworth, 1987) and has mainly flourished in elementary and secondary school settings. Since then many models of telementoring have emerged. Common to all telementoring models however is the use of Internet technologies such as e-mail or online conferencing softwares. Riel (1989) categorized these as follows: Ask an expert, pair telementorings (e.g. Pea, 1993; O'Neill & Gomez, 1998; O'Neill *et al.*, 1996) and group telementorings (Harris & Jones, 1999). Of interest to this study are the initiatives using the communal database technology called webKnowledge Forum. Unlike pair-wise or group-wise configurations, webKnowledge Forum facilitates communal mentorship. A study by O'Neill and Scardamalia (2000) using webKnowledge Forum fostered telementoring relationships between high school students enrolled in general science and biology courses and adult volunteer mentors. These individuals were professionals or graduate students whose role was to provide support and guidance on students' educational endeavours over an extended time period. The choice of technology enabled students and mentors to enter an online communal database where they were able to read and comment on not only their own discourse, but on the whole community's discussion. Initiatives of this kind represent a significant advance over 'ask an expert' telementoring initiatives where Internet technology is used in a more passive question-answer format. Rather, in webKnowledge Forum, students and mentors engage in progressive inquiry about shared topics of interest and the communal discourse is readily available for all members of the online community.

The current study used webKnowledge Forum—a computer-supported intentional learning environment, accessed over the Internet to support and augment a conventional preceptorship model. The telementorship portion of the project was an adjunctive component designed to use technology to enhance learning and under-

standing of all participants and facilitate the transition of new recruits from academe to autonomous community nursing practice.

No studies were found by these authors that evaluated the use of database or Internet technologies to support community-nursing preceptorships; however, there is evidence in the literature to suggest an increasing trend to use technology to enhance education and professional development initiatives in nursing. For example, telephone, fax and e-mail technologies are employed by the University of Alberta's distance preceptorship program, affording mentees the opportunity to gain practical experience outside their local communities (Yonge, 1997). Plank (1988) found an increasing trend for registered nurses to access accredited online CE programs for the purpose of accumulating continuing education hours (CEHs) for recertification in the United States. Weber and Lawlor (1998) describe a collaborative effort by two Pennsylvanian universities to design a professional nursing series using videoconferencing technology intended for both student nurses and practitioners in rural communities. Indeed, the widespread use of videoconferencing technologies has permeated all the health sciences and is the main technology of use in telelearning initiatives in the health sector across Canada (Keough & Roberts, 2001).

In the field of medical education, computer technology is being employed to support and augment preceptorships. For example, Stearns *et al.* (1999) designed and implemented a web-accessible 16-week instructional unit in neurology for medical clerks (interns). Results indicated students ( $N = 16$ ) were very satisfied with the experience and would register for further online courses of that nature. Rediske and Simpson (1999) designed and implemented web-based instructional modules for community preceptors aimed at cultivating preceptor skills and abilities (e.g. establishing learning goals with interns, etc.) using data presentation software (MS Power Point) and an online collaborative software tool (TopClass). A three-month pilot study conducted by Krippendorf *et al.* (1999) concluded that when medical educators were prompted to engage in reflective practice using Personal Data Assistant (PDA) technology, their teaching practice changed (e.g. some became more enthusiastic, etc.). These studies illustrate the increasing trend to incorporate computer technologies as augmentative learning and professional development tools in health care practice. However, to date the use of technologies have been limited to more commonplace modes of instruction, such as case study analysis or delivery of pre-packaged curriculum online and focused on individual as opposed to collective learning and professional development. In contrast, the current study sought to advance upon individual or dyadic and didactic learning and professional development models by employing a computer-supported communal learning environment called webKnowledge Forum.

### *Research Goals*

The goals of the study were twofold:

1. To use computer technology to shift preceptorships from dyadic to communal mentorship;
2. To provide a technological infrastructure and community conducive to professional development and to the advancement of knowledge, skills and abilities.

## **Method**

### *Participants*

In light of current nursing shortages in Canada, Saint Elizabeth Health Care (SEHC) recently changed its recruitment strategy from hiring only those nurses with a minimum of two years' professional experience, to hiring recent graduates of pre-service nursing programs. This shortage has caused problems in the province of Ontario and also affected the participants in this particular study as is highlighted below.

The design goal of SEHC's Virtual Internship Pilot Project was to provide new recruits with sufficient resources such that they could practice autonomously and cope with the complexities of community nursing practice after 16 weeks. New recruits (mentees) were partnered with nurse-mentors for face-to-face training (three to four hours per week), provided access to the organization's Intranet for online resources, and engaged in telementorship in a webKnowledge Forum database. In this article we do not report on face-to-face interactions between nurse intern and nurse preceptor, though issues that occurred in the field were discussed collectively in webKnowledge Forum. Participation in the webKnowledge Forum database was supported by administration at SEHC in the form of dedicated hours for participation. On average, participants accessed the database three to four times per week for a total of 4 to 6 hours.

All participants ( $N = 22$ ) were employees of SEHC, a community nursing organization servicing the province of Ontario, Canada. Founded in 1908, SEHC employs over 2000 multidisciplinary staff and services over 150,000 clients and families in both rural and urban Ontario, annually. Participants were from five cities in Ontario: London, Thunder Bay, Toronto, Windsor and Woodstock. Three distinct groups of nurse participants comprised this sample. Mentees ( $n = 11$ ) were recent graduates with no professional community nursing experience. Nurse-mentors ( $n = 11$ ) were community nurses with an average of 15 years' experience in community nursing and an average of ten previous preceptorship experiences. Two nurse-administrators designed the content of the Virtual Internship program and provided telementorship to both mentees and mentors in the database. However, given the focus of this article is on the role of technology to support the preceptorship program, their patterns of activity are not reported on. It is noteworthy to mention that by the end of the six-month pilot study, seven of twenty-two participants had left the organization including four mentees and three mentors, reflecting a common problem in community nursing. Sparities in wages have prompted many community nurses to transfer to more lucrative hospital settings where they also have a decreased workload and rarely encounter the feelings of isolation witnessed by community nurses.

### *Duration, Training and Technical Support*

This project began in May 2000 and concluded in October 2000. Training schedules were devised to accommodate participants' availability. All participants, with the exception of four interns who were recruited after the program began, received

two days of training on webKnowledge Forum by the project coordinator. All participants were introduced to the pedagogical and functional underpinnings of webKnowledge Forum software and received instruction on basic and advanced features such as how to create a view (communal workspace), and contribute, read and build-on to notes (narrative or graphical) in the database. All participants were provided contact information for technical and computer support throughout the program.

#### *Technological Infrastructure—webKnowledge Forum*

WebKnowledge Forum is a second-generation computer-supported intentional learning environment (CSILE). Software functions and features support advanced knowledge-building processes such as reflection, complex problem solving, progressive inquiry, synthesis and innovation. This web database technology is accessed using a web browser (e.g. Internet Explorer, Netscape Navigator). The Server runs on Linux, Windows and Macintosh operating systems. This multi-media environment allows users to create views (communal workspaces), textual and graphical notes and engage in threaded discussions using the build-on notes feature. All notes are saved in a webKnowledge Forum database and may be refined, edited or synthesized at any time by any user. Unlike one-way communication software such as e-mail, webKnowledge Forum enables all users to read, edit and comment on any note in the database, even notes created by other people. Participants accessed the database from home and work. The views in the SEHC telementorship database were divided into two main categories: Assigned Reading and Fireside Chats.

*Assigned Reading views.* At the onset of the study the articles and readings that comprised the core curriculum were scanned and posted in notes within 16 separate Assigned Reading views. Several views contained more than one reading. The readings concerned acquisition of clinical knowledge and skills (e.g. venous anatomy and physiology), patient assessment and diagnoses (e.g. elder abuse), and topics related to community nursing (e.g. health care delivery models). Each week nurses were expected to read the assigned articles, and read and comment on one another's notes.

*Fireside Chatroom views.* The purpose of these views was to allow for informal dialogue between all nurse participants about both nursing and non-nursing issues over the 16-week project. Sixteen Fireside Chat views were created where participants would go to read and contribute to general discussion. For example, one participant from Thunderbay announced the launching of Community Health Week in her city and provided all participants with general information about ceremonies and activities related to this event. In another threaded discourse during week 13, participants discussed burnout and fatigue in community nursing.

### *Evaluation Tools*

Analytic toolkit. The analytic Toolkit (Burtis, 2001) provides summary statistics on activity in a webKnowledge Forum database. It measures quantity of notes and views created by users, usership patterns (e.g. readership and modification rates) and the degree of connection between notes (e.g. build-on notes) that may be used to describe communal engagement, learning and collaboration.

*Pre- and post-evaluation questionnaires.* Evaluation questionnaires were administered online close to the start and end of the study, weeks 3 and 16, respectively. Participants completed questionnaires online. Once submitted by participants, questionnaires were routed directly to separate views in the webKnowledge Forum database and appeared as individual notes authored by respondents. Both questionnaires assessed knowledge, skills and abilities acquired as a result of participation in the telementorship project; and overall satisfaction with the program.

## **Results**

### *SEHC Communal Database Activity*

Table II reveals that mentees received the highest percentage of build-on notes from both mentors (44%) and fellow mentees (60%). Discourse between preceptor-intern (mentor-mentee) dyads was less than expected. Only 14% of all build-ons contributed by nurse-mentors were directed at their assigned mentees and only 6% of all build-ons contributed by mentees were directed at their assigned mentor. Fifty-four per cent of all mentees did not contribute any build-ons to their nurse-mentee (intern).

Overall, mentees read more notes than mentors. Both mentees and nurse-mentors read nurse-mentors notes equally. However, mentees read their own preceptors' notes more (72%) than their preceptors read mentee notes (57%). Finally, mentees read each other's notes (55%) more than nurse-mentors read the mentee notes (40%).

### *Evaluation Questionnaire Data Analysis*

Seventeen participants completed the pre-evaluation questionnaire while only 14 participants completed the post-evaluation questionnaire. Of the nine respondents who did not fill out the post questionnaire, eight are no longer employees of SEHC.

### *Knowledge Impact*

At the outset of the study, nurses identified a variety of skills and abilities they desired to improve as a result of their participation in the telementoring project. These were Internet knowledge, computer skills, asynchronous communication, problem solving, professional development and clinical practice ability. Results

TABLE I. Activity pattern of the SEHC community as measured by the Analytic Toolkit in webKnowledge Forum

| Database structures and activity patterns | Description  |
|---|--|
| Views created ( $N = 34$ )                | A view is a communal workspace created by users of the database. A total of 34 views were created, 16 Weekly Readings and 16 Fireside Chats. Weekly Reading views comprised the core curriculum of the 16-week project. Topics ranged from elder abuse to theories of nursing practice.  |
| Notes created ( $N = 956$ )               | A note created is a source note or independent note contributed to a view or copied into multiple views by a user. Notes contain narrative or graphical accounts of participants' thoughts, ideas, theories, comments, questions, and so on. A total of 956 notes were contributed to the database ranging from reflections on clinical practice to development of theories about community nursing.                     |
| Build-on notes ( $N = 576$ )              | A build-on note is attached purposefully by users to a source note or another build-on note. Build-on notes are narrative or graphical accounts of thoughts, ideas, theories, comments, questions, and so on that have some relationship to the note to which it is connected. A total of 576 build-on notes were contributed to the database; therefore 60% of all discourse in the database was threaded or connected. |
| Notes read ( $N = 11,919$ )               | Notes created and build-on notes may be opened and read by all users of the database. On average, notes were read 12 times each.   |

yielded from the post-evaluation questionnaire indicate a discrepancy between perceived and actual benefit of online collaboration in webKnowledge Forum. Seventy-five per cent of all participants reported developing professionally as a result of online participation in the telementorship project. Only 42% of participants experienced growth of knowledge of the Internet as a result of their participation,

TABLE II, Communal discourse patterns as measured by percentage of build-on notes to mentors and mentees by mentors and mentees

| Participant group | Frequency of build-on notes contributed | Percentage of build-on notes to mentees | Percentage of build-on notes to mentors | Percentage of build-on notes to assigned mentee | Percentage of build-on notes to assigned mentor |
|-------------------|---|---|---|---|---|
| Mentees           | 286                                     | 60%                                     | 20%                                     | Not applicable                                  | 6%  |
| Mentors           | 177                                     | 44%                                     | 21%                                     | 14%   | Not applicable                                  |

TABLE III. Communal readership as measured by percentage of notes read by mentors and mentees

| Participant groups | Percentage of notes read | Percentage read of all mentee notes created | Percentage read of all nurse-preceptor notes created | Percentage read of assigned mentee notes created | Percentage read of assigned nurse-preceptor notes created |
|--------------------|--------------------------|---|--|--|---|
| Mentees            | 52%                      | 55%   | 47%  | 100%   | 72%   |
| Mentors            | 44%                      | 40%   | 48%  | 57%  | 100%  |

50% reported improved computer skills, 58% reported improved asynchronous communication skills. Only 58% of respondents thought problem-solving skills improved as a result of participation and only 50% reported clinical practice ability improved as a result of the telementorship experience.

*Satisfaction.* Nurses' average satisfaction rating on a seven-point scale with web-Knowledge Forum on the post-evaluation questionnaire was 5.3. Nurses' average satisfaction rating of their online relationship (mentor and mentee dyads) was 4.6. With respect to duration of the telementorship project, nurses' average rating was 5.6. When asked if more computer training would have helped with nurses' participation, the mean response was 3.3 for all participants. Mentees did not feel more training would have helped (mean = 2.4) while nurse-mentors average rating of 4.2 would suggest, at least for some, more training would have been desirable.

Participants varied with respect to how they rated the usefulness of the Weekly Reading (curriculum). Five of 6 nurse-mentors felt the volume of reading was too high compared to nought of 6 mentees. Seven of 12 nurses felt the articles were useful for their daily practice and similarly, seven of 12 believed the emergent discussions were useful for their knowledge advancement. One mentee referred to the articles as 'simplistic'. Participants were very satisfied with webKnowledge Forum as a medium for virtual collaboration and telementorship (mean = 6 on seven-point scale). One nurse suggested linking the SEHC Intranet to webKnowledge Forum.

TABLE IV. Communal knowledge, skills and abilities improved or developed from the online interaction

| Knowledge, skills and abilities   | Pre-questionnaire | Post-questionnaire |
|-----------------------------------|-------------------|--------------------|
| Knowledge of the Internet         | 58%               | 43%                |
| Computer skills                   | 53%               | 50%                |
| Asynchronous communication skills | 84%               | 58%                |
| Enhancing problem solving         | 94%               | 58%                |
| Professional development          | 89%               | 75%                |
| Clinical practice ability         | 89%               | 50%                |



## **Discussion**

### *Creating a Community of Learners: 'telecommunity'*

The first goal of this study was to use computer technology to shift from dyadic to communal learning and professional development. In webKnowledge Forum, participant discourse is self-directed. All participants have equal opportunity to contribute notes and access notes authored by other people in the database. Discourse analysis revealed a greater amount of peer-to-peer discourse between mentees than between mentees and mentors. In contrast, nurse-mentors tended to engage in discourse with mentees about twice as often as their mentor peers. Given mentee and mentor dyads met face-to-face three to four times weekly, we did not find the general pattern of lower discourse activity between mentees and nurse-mentors alarming. However, we consider the high degree of collaborative discourse between mentee peers evidence of how traditional hierarchical and dyadic models (preceptor–intern) may be transformed using communal database technologies and lead to distributed and opportunistic learning and collaboration—webKnowledge Forum provided an online medium for opportunistic peer-to-peer mentorship.

Similarly, closer examination of readership activity in the database reveals a fairly distributed readership pattern by both mentees and mentors—all tended to read about half of all notes entered into the database, and were more likely to read notes authored by the other member of their dyad. The technological infrastructure enabled preceptor–intern dyads to glean information, knowledge and wisdom from the entire community, creating what Woodruff (in conversation) refers to as a 'telecommunity'. Interestingly, although participants reported high satisfaction with the technology, they were less satisfied with the nature of the online dyadic relationship, again supporting the argument that dyadic preceptorship models endemic in nursing education and practice may profit from a communal configuration.

### *Knowledge Impact and Professional Development*

The second goal of this study was to provide a technological infrastructure and community conducive to professional development and to the advancement of knowledge, skills and abilities. Overall, results suggest that all nurse-participants anticipated a greater increase in knowledge skills and abilities at the outset of the study than were realized by the end of the study. However, the majority of respondents did report having developed professionally and improved asynchronous communication and problem-solving abilities. The degree to which curriculum content facilitated or impeded acquisition of knowledge, skills and abilities was not apparent from the questionnaire data. In the current study, the content of the curriculum was chosen and designed by nurse-administrators at SEHC exclusively. Future iterations of design would address integration of Internet resources into the webKnowledge Forum databases and link learning goals to curriculum design and choice of content.

Of note, nurse-mentors favoured more computer training and less prescribed reading. Letizia and Jennrich's (1998) research assessing the qualities of preceptors

and interns found that methods of preceptor selection and role preparation need to be further developed. This raises the issue of appropriateness of selection criteria for online preceptors versus face-to-face preceptors. Whereas in traditional face-to-face preceptor–intern relationships the roles of both are defined by the expertise of the former, in online relationships this is not always the case. In fact, in the current study, interns possessed greater computer literacy skills than their more clinical expert preceptors. A positive outcome of this difference in knowledge bases was that interns were encouraged to seek help from one another and other preceptors in the database, the result of which was distributed and reciprocal learning. Mentees in this study possessed better computer literacy skills than their more clinically skilled nurse-mentors and may have contributed to the higher rates of mentee activity in the webKnowlede Forum database. However, future iterations of design would do well to assess computer literacy skills prior to the onset of the study, and provide remedial training for the computer challenged. As well, future research would do well to assess knowledge impact (e.g. clinical skills, problems solving, etc.) with measures other than self-report questionnaires to better determine the knowledge impact of telementorship.

## Conclusion

The field of telementoring research is in its infancy. The current study borrowed from exemplary elementary and secondary school telementorship research and developed a model to support community nurses. It is concluded that this project succeeded at designing and implementing a telementorship initiative that transformed the traditional dyadic preceptor–intern training model into a community of learners’ model that resulted in communal learning and professional development for the majority of participants.

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