Telementoring in community nursing: Transforming preceptor-intern training models.

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Abstract

This paper reports on a 6-month telementoring initiative in a Canadian community nursing organization. Although mentorship in the health professions has become embedded in preceptor-intern education and training models, the way in which new technologies may support and augment mentorship initiatives is a relatively unexplored area of research and is the focus of this study. Participants (N=24) in this study were all employees of SEHC and included nurse-preceptors (n=11), nurse-interns (n=11) and nurse-administrators (n=2). The medium for telementorship was webKnowledge Forum, a second-generation computer supported intentional learning environment (CSILE). Results indicate that nurse-interns contributed and read more notes than nurse-preceptors and were more likely to engage in threaded discourse with peers, while readership was patterns were similar for both groups. Fifty-eight per cent of all nurses reported improved asynchronous communication and problem solving skills, 75% 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 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.
Introduction

*From preceptorship to mentorship and beyond*

Although preceptorships are the benchmark of nursing education, the current study sought to incorporate telementorship into the design of a preceptorship program intended to support new recruits in community nursing. In traditional one-to-one preceptorships, preceptors are paired with students or interns. However, the current study sought to capitalize on the affordances of communal technologies that would permit preceptor-intern dyads to learn from other colleagues in the same project and access the information, knowledge and wisdom of the entire community.

The concept of preceptor may be traced to the sacred Hindu texts called Vedas that date back over four centuries. There, one may find written many laws governing human behavior, including devotion to a preceptor. Preceptors chanted and recited Vedic mantas to students, whose devotion was marked by passive listening and internalization of sacred texts. The notion of a preceptor as a more knowledgeable other who provides one-to-one education and tutoring to a student first appeared in the nursing literature in the mid-1960s (Dusmohamed & Guscott, 1998; Hayes, 1994). Preceptors are usually seasoned clinicians in practice settings who provide one-to-one guidance and education to nurse-interns or students (Usher, Nolan, Reser, Owens, & Tollefson, 1999). 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, Rather, & Guyette, 1997). Similarly, preceptor-intern training models at the workplace are designed to facilitate the transition of novice nurse practitioners from supervised to autonomous clinical practice, or provide experienced nurses with new learning opportunities to upgrade clinical skills and abilities.
Generally, evaluative research regarding the effectiveness of nursing preceptorships is in its infancy, is localized to hospital rather than community settings, and preliminary results are inconsistent and inconclusive (Brehaut, Turik, & Wade, 1998). However, an overview of the nursing literature reveals that the role of preceptor as tutor or instructor has evolved to encompass the concepts of role model (Eddy & Schermer, 1999; Letizia & Jennrich, 1998) and mentor (Hayes, 1994). The modern concept of mentor as a wise and knowledgable person who provides guidance and counsel to a less experienced other finds its origin in Homer's *The Odyssey* (trans 1974). Unlike the passive knowledge telling approach (e.g., recitation and memorization) used by Hindu preceptors in ancient times, Athena, Goddess of Wisdom and Knowledge, used a dialogical approach to guide Telamachos on his journey to find his Father, Odysseus appearing to Telamachos in the guise of Mentor. In the same way that Mentor served as wise counsel on Telamachos' journey, ideally the current day nurse-preceptor partners with interns on a journey of learning and enculturation into the profession of nursing.

Indeed, key motivators of engagement in preceptorships of both preceptors and interns are opportunities for reciprocal learning and professional development (Dibert & Goldenberg, 1995; Usher, Nolan, Reser, Owens, & Tollefson, 1999). When asked to identify the characteristics of the best preceptors, students reported the ability to role model, provide constructive criticism and foster a climate of mutual respect (Kotzabassaki et al., 1997). Dunn and colleagues (1997) found that students' perception of staff-preceptors as supportive, engaged in reciprocal learning, and legitimizing students' role on the team as key elements of positive clinical learning environments. Research also indicates that shared control between preceptors and interns and democratization of the power differential (Butterworth & Faugier, 1992) between preceptors and interns results in better student learning outcomes and patient care (Hrling & Hallberg, 2000). Similarly, Dunn and colleagues (1997) surveyed nurses who reported that hierarchy and ritual impeded learning in clinical environments. In sum, the literature does suggest the need for preceptorships to extend
beyond didactic instruction, to provide mentorship and opportunities for reciprocal engagement, learning and collaboration (Collins, Hilde, & Shriver, 1993; Hayes & Harrell, 1994; Letizia & Jennrich, 1998).

**Telementorship in community nursing**

The current study sought to use a telementorship model to support and transform face-to-face preceptorships. 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 (ONeill, Abeygunawardena, Perris, & Punja, 2000). This study borrowed from exemplary telementoring initiatives in the K-12 sector. Specifically, O Neill and Scardamalia (2000) used a communal database technology called webKnowledge Forum to foster telementoring relationships between highschool students enrolled in general science and biology courses and adult volunteer mentors who shared similar interests. The choice of technology enabled students and mentors to enter a virtual communal database where they were able to read and comment on not only their own discourse, but the whole community's discussion. Initiatives of this kind represent a significant advance over ask an expert web sites 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 virtual community.

In the same way as Mentor served as Athena’s communication tool or virtual medium, the current study used webKnowledge Forum a computer supported intentional learning environment, accessed over the Internet. The telementorship portion of the project was an adjunctive component designed to use technology to enhance learning and understanding of all participants.
and facilitate the transition of new recruits from academe to autonomous community nursing practice.

No studies were found by this author 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 nurse-interns 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 & 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 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, Londo & Glasser (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 on-line courses of that nature. Rediske & 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 power point and TopClass. A 3-month pilot study conducted by Krippendorf, Simpson & Schiedermayer (1999) concluded that when medical educators were prompted to engage in reflective practice using 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 healthcare practice. However, to date, 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 transform dyadic preceptorships into a community of learners and enhance distributed and opportunistic learning and collaboration.

2) To provide a technological infrastructure and community conducive professional development and to the advancement of knowledge, skills and abilities.

Method

Participants

In light of current nursing shortages in Canada, SEHC recently changed its recruitment strategy from hiring only those nurses with a minimum of two years experience, to hiring recent graduates of pre-service nursing programs. 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 (nurse-interns) were partnered with nurse-preceptors for face-to-face training (3 to 4 hours per week), provided access to the organization’s Intranet for online resources, and engaged in telementorship
in a webKnowledge Forum database. 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 3 to 4 times per week for 4 to 6 hours.

All participants (N=24) were employees of Saint Elizabeth Health Care (SEHC), a community nursing organization servicing the province of Ontario, Canada. Founded in 1908, SEHC employs over 2,000 multidisciplinary staff and services over 150,000 clients and families in both rural and urban Ontario, annually. Participants were from 5 cities in Ontario: Toronto, London, Thunder Bay, Toronto, Windsor and Woodstock. Three distinct groups of nurse participants comprised this sample. Nurse-interns (n=11) were recent graduates with no professional community nursing experience. Nurse-preceptors (n=11) were community nurses with an average of 15 years experience in community nursing and an average of 10 previous preceptorship experiences. Nurse-administrators (n=2) designed the content of the Virtual Internship program and provided telementorship to both nurse-interns and nurse-preceptors in the database. However, given the focus of this paper is on the role of technology to support preceptorship program, their patterns of activity are not reported on. It is noteworthy to mention that by the end of the 6-month pilot study, 7 of 22 participants had left the organization including 4 nurse-interns and 3 were nurse-preceptors.

Duration, Training and Technical Support

This project began May 2000 through October 2000. Training schedules were devised to accommodate participants availability. All participants, with the exception of 4 interns who were recruited after the program began, received 2-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 (Learning in Motion, 1997) 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. Knowledge Forum is the most thoroughly researched on-line communal learning environment that is commercially available. 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 Readings 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 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 (Russell & Perris, 2000) were administered online close to the start and end of the study, weeks 3 and 16, respectively. Participants were provided a URL and asked to complete questionnaires on-line. 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 I: Activity pattern of the SEHC community as measured by the Analytic Toolkit in webKnowledge Forum

<table>
<thead>
<tr>
<th>Database structures and activity patterns</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Views Created (N=34)</td>
<td>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.</td>
</tr>
<tr>
<td>Notes Created (N=956)</td>
<td>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.</td>
</tr>
</tbody>
</table>
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 created and build-on notes may be opened and read by all users of the database. On average, notes were read 12 times each.

Table II: Preceptor-intern discourse patterns as measured by percentage of build-on notes to nurse-preceptors and nurse-interns by nurse-preceptors and nurse-interns

<table>
<thead>
<tr>
<th>Participant Group</th>
<th>Frequency of build-on notes contributed</th>
<th>Percentage of build-on notes to nurse-interns</th>
<th>Percentage of build-on notes to nurse-preceptors</th>
<th>Percentage of build-on notes to assigned nurse-intern</th>
<th>Percentage of build-on notes to assigned nurse-preceptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse-interns</td>
<td>286</td>
<td>60%</td>
<td>20%</td>
<td>----------</td>
<td>6%</td>
</tr>
</tbody>
</table>
Table II above reveals that nurse-interns received the highest percentage of build-on notes from both nurse-preceptors (44%) and fellow nurse-interns (60%). Discourse between preceptor-intern dyads was less than expected. Only 14% of all build-ons contributed by nurse-preceptors were directed at their assigned nurse-interns and only 6% of all build-ons contributed by nurse-interns were directed at their assigned nurse-preceptor. Fifty-four per cent of all nurse-interns did not contribute any build-ons to their nurse-preceptor.

Table III: Preceptor-intern readership as measured by percentage of notes read by nurse-preceptors and nurse-interns

<table>
<thead>
<tr>
<th>Participant Groups</th>
<th>% Notes read</th>
<th>% Read of all nurse-intern notes created</th>
<th>% Read of all nurse-preceptor notes created</th>
<th>% Read of assigned nurse-intern notes created</th>
<th>% Read of assigned nurse-preceptor notes created</th>
<th>% Read of Total Administration Notes Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse-interns</td>
<td>52%</td>
<td>55%</td>
<td>47%</td>
<td>-------------------------------------------</td>
<td>72%</td>
<td>50%</td>
</tr>
</tbody>
</table>
Overall, nurse-interns read notes more than nurse-preceptors. Both nurse-interns and nurse-preceptors read nurse-preceptors notes equally. However, nurse-interns read their own preceptors' notes more (72%) than their preceptors read nurse-intern notes (57%). Finally, nurse-interns read each other's notes (55%) more than nurse-preceptors read the nurse-intern notes (40%).

**Evaluation Questionnaire Data Analysis**

Seventeen participants completed the pre-evaluation questionnaire (9 nurse-interns and 8 nurse-preceptors) while only 14 participants completed the post-evaluation questionnaire (9 nurse-interns and 8 nurse-preceptors). Of the 9 individuals who did not fill out the post questionnaire, 8 are no longer employees of SEHC.

**Knowledge Impact**

Table IV: Knowledge, skills and abilities improved or developed from the on-line interaction

<table>
<thead>
<tr>
<th>Knowledge, Skills and Abilities</th>
<th>Pre-Questionnaire</th>
<th>Post-Questionnaire</th>
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<tbody>
<tr>
<td>Knowledge of the Internet</td>
<td>58%</td>
<td>43%</td>
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</table>
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. They were Internet knowledge, computer skills, asynchronous communication, problem solving, professional development and clinical practice ability. Results 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, 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 7-point scale with webKnowledge Forum on the post-evaluation questionnaire was 5.3. Nurses’ average satisfaction rating of their online relationship (nurse-preceptor and nurse-intern 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 (on a 7-point scale) for all participants. Nurse-interns did not feel more training would have helped (mean=2.4) while nurse-preceptors 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 Weekly Readings (curriculum). Five of 6 nurse-preceptors felt the volume of reading was too high compared to 0 of 6 nurse-interns. Seven of 12 nurses felt the articles were useful for their daily practice and similarly, 7 of 12 believed the emergent discussions were useful for their knowledge advancement. One nurse-nurse-intern referred to the articles as simplistic. Participants were very satisfied with webKnowledge Forum as a medium for virtual collaboration and telementorship (mean=6 on 7-point scale). One nurse suggested linking the Intranet to webKnowledge Forum.

Discussion

Creating a community of learners Telecommunity

The first goal of this study was to use computer technology to transform dyadic preceptorships into a community of learners and enhance distributed and opportunistic learning and collaboration. 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 nurse-interns than between nurse-interns and nurse-preceptors. In contrast, nurse-preceptors tended to engage in discourse with nurse-interns about twice as often, than their nurse-preceptor peers. Given nurse-intern and nurse-preceptor dyads met face-to-face 3 to 4 times weekly, we did not find the general pattern of lower discourse activity between nurse-interns and nurse-preceptors alarming. However, WEconsider the high degree of collaborative discourse between nurse-intern 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 a virtual medium for opportunistic peer-to-peer mentorship.

Similarly, closer examination of readership activity in the database reveals a fairly distributed readership pattern both nurse-interns and nurse-preceptors all tended to read about half of all notes entered into the database, and were more likely to read notes authored by 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 tele-community. Interestingly, although participants reported high satisfaction with the technology, they were less satisfied with nature of the on-line 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 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. It was not apparent from the questionnaire data the degree to which curriculum content facilitated or impeded acquisition of knowledge, skills and abilities. 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-preceptors favoured more computer training and less prescribed reading. Letizia et al 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 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 on-line 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. Nurse-interns in this study possessed better computer literacy skills than their more clinically skilled nurse-preceptors and may have contributed to the higher rates of nurse-intern activity in the webKnowledge Forum database. However, future iterations of design would do well to assess computer literacy skills prior to the onset of the study, and provide training 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 K-12 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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