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Interactive Teaching Technologies that Facilitate the Development of Online Learning Communities in Nursing and Health Studies Graduate Courses

By Beth Perry & Margaret Edwards

Abstract

Online teaching technologies that incorporate social interaction facilitate the development of a culture of community in online classes. This sense of community contributes to positive learning outcomes for students and a sense of professional fulfillment for instructors. Online teaching technologies of photovoice, conceptual quilting, and virtual reflective centers are described. The Community of Inquiry Model (Rouke, Garrison, Anderson, & Archer, 2001) and Social Development Theory (Vygotsky's, 1978) provide the framework for discussion. Teacher educators who want to create a sense of community with online learners may find this paper informative. The teaching technologies presented could be adapted for use by teacher educators. Emerging trends related to interactive teaching technologies in online education and ideas of future research conclude the paper.

Interactive Teaching Technologies that Facilitate the Development of Online Learning Communities in Nursing and Health Studies Graduate Courses

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In our experience, interactive teaching technologies have had a positive impact on the teaching of nursing and health studies in graduate courses online. Specifically, the use of teaching technologies that incorporate social interaction facilitates the development of a culture of community in our online classes. This sense of community seems to contribute to positive learning outcomes for the students and a sense of professional fulfillment for the instructors.

The program in which we teach is offered by the health disciplines faculty at a large online university. Students in this program choose a Masters of Nursing, Masters of Health Studies, or a Masters of Advanced Nursing Practice. Since the program began in 1996, all courses have been taught completely online, upholding the foundational value that time and place should not interfere with the pursuit of graduate education. The program is unique in that learners and teachers never meet in person (except for a brief residency component in the Advanced Nursing Practice stream). The entire learning experience is accomplished using an online learning platform called Moodle that allows for discussions, readings, and other virtual teaching approaches such as those technologies described in this paper. Specific online teaching technologies that have been explored by the authors include photovoice, conceptual quilting, and virtual reflective centers (Perry & Edwards, 2005; Perry, 2006). Through the use of these, and other interactive online teaching technologies, the authors have created virtual communities of online learners.

The authors have engaged in studies exploring what makes online educators effective (Perry & Edwards, 2005) and investigations of the effectiveness of various online teaching technologies (Perry, Dalton, & Edwards, 2008). The preliminary outcomes of these studies point to the importance of using interactive teaching technologies to create online classrooms in which students feel a part of a community of learners.

The major goal of this paper is to describe specific online teaching technologies that may facilitate the creation of virtual online learning communities. A second complementary objective of this paper is a review of related research literature, which assists in explaining why interactive teaching technologies may help create effective online communities. The review also points out areas for further research. While the paper is based on our experience with online nursing and health studies graduate courses, the discussion presented may also have relevance for teacher educators as the goal of creating a sense of community amongst online learners transcends disciplinary boundaries.

The background section of this paper begins with the literature review. The main section of the paper is a description of three interactive, online teaching technologies. Finally, we discuss future and emerging trends related to interactive teaching technologies in online education and ideas of future research.

Background

Although the learning environment has changed over time from traditional face-to-face classroom settings to more virtual learning environments, the importance of a sense of community bonding students with one another and with their instructor has remained important. This literature review begins with a look at studies that support the importance of the sense of community in education and extends to a discussion of why community is especially important in the virtual classroom. Examples of pedagogical strategies that online instructors may use to create this sense of community in their virtual classes are provided. The sense of community to then described in relation to the Community of Inquiry Model and Social Development Theory which form the conceptual framework for this paper.

Classrooms as Learning Communities

Since 3000 B.C. formal learning has been organized with groups of learners and a teacher gathered together in a classroom for the purpose of teaching and learning (Watkins, 2004). Originally, the dominant belief driving the activities in the classroom was that learning was best achieved by the one-way transmission of knowledge from teacher to student. Over time, research has sought to answer the questions of whether this approach is the most effective, and what could make it more effective. For example, Wang, Haertel, and Walberg (1990) conducted quantitative research and concluded that classroom management, including the teacher's

management of social relations and learning in the classroom, is a variable in successful teaching. In other words, they found that the effective classroom is a community in a social sense and that the teacher is primarily responsible for facilitation of the social aspect of the educational environment. The Wang et al. (1990) findings are supported by a large study by Marzano (1998) that concluded, in part, that the effective classroom enacts community values, such as the exchange of beliefs and ideas. The view that effective learning involves constructing knowledge *with* others in a classroom community is supported by other researchers (Abbott & Fouts, 2003; Peterson, Carpenter, & Fennema, 1989). Bandura (2000) concludes that in classrooms where a sense of community exists, learners are active and engaged which promotes learning. The "collective efficacy" that results in such a classroom environment is motivational for learners resulting in "greater performance accomplishments" (Bandura, 2000, p. 78).

Bakhtin's ideas around the importance of "dialogue" in education may help us understand why community, and the sharing of ideas that may be prompted by involvement in a classroom community, seem important to learning. Dialogue involves two voices: that is, sense cannot be made, and learning does not readily occur, if only one person (one voice) is involved. To illustrate this, Bakhtin (1986) wrote, "if an answer does not give rise to a new question from itself, it falls out of the dialogue" (p. 168). For dialogue to be a means to learning, a social element in the learning environment, where more than one voice is heard, seems a requirement. Wegerif (2006), basing his counsel on Bakhtin, wrote, "we need to teach students how to engage in dialogues through which knowledge is constantly being constructed, deconstructed and reconstructed" (p. 58). Meaning comes from dialogue, or as Volosinov wrote, "meaning is like an electric spark that occurs only when two different terminals are hooked together" (cited in Wegerif, 2006, p. 59). The links between successful, satisfying learning and the social element of the educational environment are logical and supported by emerging literature. Is it equally important to have a sense of community, with its opportunities for interaction and dialogue, in the online educational environment?

Virtual Classroom Communities

With the dawn of online education, the traditional face-to-face classroom was transformed, in some instances, into a virtual classroom. Research regarding factors that positively influence learning in this new version of the classroom appeared with the increasing move to online learning. As in the traditional classroom, a sense of community emerged as an important factor

in teaching-learning success in the virtual classroom (Kehrwald, 2008; Moule, 2006; Rice - Lively, 1994; Rovai, 2002a; Saritas, 2008).

Rice-Lively (1994) used ethnography to describe a networked learning community of master's and doctoral students. Rice-Lively described the electronic learning community that formed and explored the cultural meanings of class pedagogical events. In this study, the culture of community gave rise to the active involvement and participation of learners. Rice-Lively's findings gave us an early glimpse of the importance of the social aspect of the online educational environment.

In 2002, Rovai published a paper arguing that virtual classrooms had the potential to build and sustain a sense of community, further refuting the once-held belief that this was only possible in a traditional classroom. Rovai defined a learning community as a group of students who have feelings of trust and belonging, possess shared expectations, and are committed to shared educational goals (2002a). A sense of online community, according to Rovai's model, "consists of four related dimensions: spirit, trust, interaction, and commonality of learning expectations and goals" (2002a, p.12). This sense of community belongingness brought with it the potential for greater learner participation and motivation.

More recently, Moule (2006) conducted research specific to the development of online communities of learners involving health care students. Using a case study approach Moule found that "mutual engagement," "joint enterprise," and "shared repertoire" were all necessary to support, and resulted from, the development of an online educational community (or what she called an e-community) (pp.133-139). These themes are reflective of the community centered elements identified by Rovai.

Saritas (2008) explored the role of computer conferencing systems (CCS) as a strategy that teachers could use to create a community of learners in the Internet classroom. Saritas found that asynchronous online computer conferences offered the opportunity for social interaction and dialogue that facilitated knowledge construction activities in a virtual classroom. It was the construction of knowledge through the collaborative learning process that Saritas found was the most positive outcome of the CCS.

Kehrwald (2008) also looked at the construction of knowledge through social interaction in an online learning environment. Using a case study design Kehrwald studied the learners'

experiences of social presence in a virtual classroom. In part, he concluded that a positive experience of social presence is critical for successful education to occur in an online classroom.

Moisey, Neu, and Cleveland-Innes (2008) explored the relationship between several variables and cohesion in the virtual classroom using Rovai's (2002b) Classroom Cohesion Scale. Cohesion was considered to be an element of a sense of community. These researchers found significant positive correlations between course satisfaction and community cohesion and between program satisfaction and community cohesion (Moisey, et al., 2008). In other words, students who experienced a sense of cohesion, which resulted in part from positive relational elements in the online classroom, were more satisfied with their learning experience.

Shea (2006) identified three major shifts that result from, or perhaps propel, the focus on the importance of the community and social interaction in the online learning experience. Specifically, the movements include: the philosophical shift from objectivism towards constructivism, a theoretical shift from behaviorism towards socio-cognitive views of education, and a pedagogical shift from direct instruction to the facilitation of collaborative learning. Shea argued that these foundational changes encourage teaching approaches that help to develop virtual learning communities believing that student-centered, learner-directed, interactive, participative pedagogical methods are congruent with the establishment of community in the online class, in social interaction, and ultimately in learning (2006).

This research literature informed the teaching technologies developed by the authors and described in this paper. The teaching technologies of photovoice, conceptual quilting, and virtual reflective centers may be effective because they create opportunities for dialogue and interaction among learners and between the students and instructor. This increased meaningful social interaction may result in sharing of personal values, opinions, and ideas that in turn may facilitate the experience of being a part of a community. An increased sense of community in the virtual educational environment, in which learners feel a sense of belongingness, may enhance learner participation and motivation. In virtual classrooms where a sense of community is developed and students are active and engaged, learning is more likely to occur. This has been both our goal and our experience in online classrooms when we used the teaching technologies of photovoice, conceptual quilting and virtual reflective centers.

Community of Inquiry Model

Elements discussed thus far in the literature review, including a sense of belonging to an educational community where learners are actively engaged in the learning experience through dialogue, are reflected in the Community of Inquiry (COI) Model (Rourke, Garrison, Anderson, & Archer, 2001). The COI model highlights three major aspects of the online educational community: social presence, cognitive presence, and teaching presence. All overlap to form the educational experience of the learner (Rourke, et al, 2001). These researchers concluded that educational strategies that result in adequate levels of cognitive, social, and teaching presence in the virtual classroom are necessary for meaningful learning to occur. A COI is created online when a group of people who are strongly linked both socially and cognitively, experience learning through the leadership of a teacher (teaching presence). Social presence, or the sense of relationship, occurs among learners who project their personal qualities into the learning environment and as Rourke et al said, "become real people" (2001, p. 87). Cognitive presence, the third element of the model, is considered the extent to which learners are able to make meaning through interaction and discussion in a critical community of inquiry (Rourke, et al., 2001).

More recently, McKerlich and Anderson (2007) conducted an exploratory, observational study to assess whether the COI was recognizable in a Multi User Virtual Environment (MUVE) learning environment and to see if the presence indicators of the COI were effective as a tool to assess learning events which occurred. They found the COI helpful in understanding the nature of learning in this virtual online learning world. This study helps to confirm that the COI model is relevant as a framework to use both in designing new online teaching technologies and in enhancing our understanding regarding why a particular teaching strategy may be effective.

Social Development Theory and Learning

Vygotsky's (1978) Social Development Theory (SDT) is another element in the conceptual frame for this paper. Social Development Theory is a component of social learning and situational learning theory; it is one of the foundations of constructivism (Driscoll, 1994). According to SDT, social interaction is fundamental to cognitive development. Specifically, consciousness and cognition result from socialization and social behavior. Vygotsky focused on the connections between people and the sociocultural context in which they act and interact in shared experiences (Crawford, 1996). Hung (2001) elaborated noting that in SDT learning is

characterized by mediation through language, discovery of differing perspectives, and achievement of shared meaning.

Many teachers (face-to-face and online) have traditionally held a transmissionist approach, seeing themselves as transmitters of information to students. Vygotsky's SDT challenges this view and promotes learning environments in which students play an active role in learning. In such situations, the roles of the teacher and learner have shifted. Teachers, rather than being transmitters of knowledge, collaborate with students to facilitate the learners' acquisition of new knowledge, skills, and attitudes. Learning becomes a reciprocal experience involving self and other.

Applying SDT to online education, proponents would assume that knowledge is constructed by students in this milieu. Learners require effective strategies to facilitate interacting from a distance with fellow learners and with the teacher. In online teaching, emphasis is still placed on the importance of interaction with people, the connections between participants, and the social context as it influences learning; however, the strategies for achieving this may be different from those used in a face-to-face classroom. When appropriate teaching strategies are used, online learners can still achieve with other students and teachers the connections and shared experiences that, according to SDT, facilitate learning (Perry, 2006).

Dabbagh (2004) argued that the advent of Internet-based telecommunications technology has actually increased the potential for interaction and collaborative work in online courses and thus changed the social and pedagogical perspective of distance learning. We have taken Dabbagh's claim and enacted it by introducing teaching technologies in our online courses that encourage interaction and collaboration. In this way we have harnessed the potential of the Internet in distance education (Perry, Dalton, & Edwards, 2008).

The interactive teaching technologies discussed in the following sections were found to facilitate the development of the culture of community in online graduate courses. Through shared experiences, common meanings developed, and connections were made using the teaching technologies of photovoice, virtual reflective centers, and conceptual quilting. Students reported benefiting scholastically from the sense of community that arose when they participated in these learning activities. Both students and teachers reported that their virtual learning communities were highly effective learning environments, in part because of the inclusion of these teaching strategies (Perry, Dalton, & Edwards, 2008).

Perry, Dalton, & Edwards (2008) also found that when the teacher-learner relationship in an online classroom involves social interaction and the shared making of new meanings, there is a sense of "learning with." In other words, there is a reciprocal aspect to the experience. The concept of cognitive presence in the COI model may capture some of this theme of "learning with." In the opinion of Archer et al., (2001) the online instructor establishes cognitive presence by introducing factual, conceptual, and theoretical knowledge into the discussion. In doing so, a sustained discussion results. Perhaps in meaningful discourse there is a responsibility on the part of both the teacher and the learner to contribute knowledge in the form of examples, quotations, references and insights to the conference exchange. In doing so, sustained discussion that is rich in quality as well as duration, is more likely to result.

In summary, it seems it is the experience of community that is important to learning both in the traditional face-to-face classroom and in the online situation. The sense of community is achieved through social interaction, and through social interaction, the sense of community expands. The key element in the establishment and further development of community seems to be social interaction. The sense of community, established at least in part by meaningful social interaction, seems fundamental to learning. Whether the classroom is traditional or virtual, SDT and the COI model, guide teachers to attempt to create learning environments in which participants feel they belong, actively participate, and are part of shared expectations. Following such a philosophy, teachers become collaborative partners with students so that through social interaction within a community learning can occur. According to the COI model it is the experience or "presence" of participants in the educational experience that facilitates community, social interaction, and eventually meaningful learning: perhaps for both the teacher and the student. Against this literature background, examples of specific interactive teaching technologies that facilitate the development of online learning communities are presented.

Interactive Teaching Technologies that Facilitate the Development of Online Learning Communities

We propose that photovoice, conceptual quilting, and virtual reflective centers are teaching technologies that could be used by educators in various disciplines including education to help create community in virtual classrooms. Within these communities learners are able to collaborate to complete group projects and share information within both the social and cognitive spheres. In the following sections, three teaching technologies are described and examples

provided. Discussion regarding the effectiveness of each technology from the perspective of students is also discussed.

Photovoice

Photovoice (PV) was originally used as a participatory-action research methodology (Wang & Burris, 1997). Research participants were given cameras and asked to photograph their experiences. In this way participants were able to give voice to their perceptions and insights (Wang, 1999). Perry (2006) adapted the PV research method and transformed it into an interactive online teaching technology that builds on the theoretical understandings established in the education literature related to critical consciousness and feminist theory (Wang & Burris, 1997; Wang, Burris & Xiang, 1996). Specifically, the PV teaching technology involves the online instructor posting a digital photographic image for the class at the onset of each unit in the course. Each purposefully selected image is accompanied by a reflective question posed by the instructor. Students are invited to look at the image and to post their response to the question in a conference forum dedicated to PV postings. For example, in a course on change management one of the photos was of a leaf changing color in the autumn and the accompanying question was, "What aspects of organizational change parallel the changes you see in nature?"

Perry, Dalton and Edwards conducted a study of students' experiences with the PV exercise and found that this activity encouraged engagement in the course, enhanced the learning environment, and helped the virtual class to develop a sense of social connectedness (2008). Further these researchers found that the PV activity helped to build an online community classroom that demonstrated the dimensions of spirit, trust, interaction and common learning expectations that are noted by Rovai as important to the development of online community (2002a, p. 3).

Perry et al. (2008) also analyzed the PV teaching strategy using the lens of the Community of Inquiry Model (Garrison, Anderson, & Archer, 2000). The students noted that through activity involvement with the PV, they linked with other classmates socially, were stimulated cognitively, and experienced the sense of an immediate presence of the instructor. See Appendix A for examples of the photovoice teaching technology.

Conceptual Quilting

The online interactive activity of conceptual quilting (CQ) was developed by the authors and has been used in online graduate courses as a summary activity at the end of 13 week

courses. The CQ exercise asks students to construct a virtual quilt that is comprised of the ideas, metaphors, theories and other details from the course that were the most personally meaningful to them. The CQ is a pictorial representation of their own experiences with the course materials, classmates, and the instructor. The medium used for the CQ is left to the student, but the exercise specifies that it needs to be in a form that can be shared electronically with the class.

Further interaction comes during the CQ activity when classmates respond to the image that is shared. Through asynchronous online discussion students direct comments and questions to the designer of each quilt. The quilt-maker responds to the questioner and often other class members join the discussion. This often results in a resurgence of dialogue around a course theme that was depicted in the quilt. The CQ activity was popular and students had multiple exchanges with the quilt designer as each quilt was displayed electronically. In effect, the CQ served as stimuli for further dialogue between members of the class (teachers and students) related to class themes that appeared in the quilts. Bakhtin's (1986) views of the importance of dialogue to education were supported by the outcomes of this activity.

Although this interactive activity has yet to be evaluated using a rigorous research process, it has been assessed anecdotally and through routine course evaluations. Students consistently comment that the CQ activity was effective at helping them to review what they learned in the course from a broad perspective. It was noted by many students that in order to construct their quilt they needed to review their notes and assignments. This exercise helped them reflect on what they had learned and assisted them in consolidating their learning. From a social interactive perspective, the sharing of the completed quilts online was a way for students to acknowledge the impact that others (teachers and peers) had had on their learning journey. It was in a sense an exercise that effectively brought closure to the course, and helped students to acknowledge and say farewell to their classmates and instructor, a step that may be absent in the online classroom situation.

Looking at CQ in terms of Rovai's elements of the effective virtual classroom, it particularly had positive influence on the spirit of the class. To Rovai "spirit, denotes recognition of membership in a community and the feelings of friendship, cohesion, and bonding that develop among learners as they enjoy one another and look forward to time spent together" (2002a, p.3). The virtual quilts were a visual documentation of the experience of community and

the sharing of these artistic pieces seemed to forge a bond between classmates. See Appendix B for examples of the conceptual quilting teaching technology.

Virtual Reflective Centers

Ronaldson (2004) developed an interactive online teaching strategy called "virtual reflective centers" (VRC) and evaluated it with undergraduate nursing students as part of her doctoral research. Virtual reflective centers are role-playing simulation exercises that are reported to enhance critical thinking and promote social presence online (Ronaldson, 2004). Ronaldson organized this learning experience so that students visited virtual centers where they had access to profiles of various simulated patients. The profiles included laboratory values, results of diagnostic tests, and other patient history information. Students used this information to engage in nursing interventions appropriate for meeting specific learning objectives.

There is an abundance of virtual simulation software and other modeling resources available that in some ways are similar to VRCs. In nursing education, such computer simulation activities are often referred to as computer-assisted instruction (CAI) (Madorin & Iwasiw, 1999) or human patient simulation (Beyea & Kobokovich, 2004). Simulation activities that are part of CAI and human patient simulation are usually focused on specialized nursing skills such as assisting in the operating room, operating specific equipment, or other techniques and procedures that involve psychomotor proficiencies. The focus of CAI and human patient simulation is typically on physical care rather than interpersonal skills. Simulation software suites may be expensive and the instructor and students must be taught to use them effectively. Alternatively, VRCs can be easily developed by the instructor, without the use of sophisticated software, tailored to meet the learning needs of a particular class, and can focus on psychosocial skills, such as interviewing patients.

Cubbon trialed VRCs in an online graduate course for advanced nursing practice students (2008). Although the key elements of the teaching strategy were similar to Ronaldson's approach, Cubbon organized the VRC slightly differently. In this instance all students in an online class were randomly assigned to either a patient or a nurse practitioner role. Each participant was briefed as to their part in the VRC via an email from the instructor. The "patient" requested an appointment with the "nurse practitioner" and they agreed to a time when the online appointment would take place. Both participants were given a case study that included all the information that a practitioner would reasonably have access to from a patient's chart. During the

appointment, the student who was role-playing the nurse practitioner interviewed the patient and in doing so assessed the patient, provided psychosocial support, and conveyed health education. All of these activities are considered elements of the nurse practitioner role and the student had the opportunity to practice them in a virtual situation. Once all the appointments were completed, the instructor sent a list of reflective questions to all class members and an asynchronous group discussion and reflection session occurred via the Internet.

The VCR teaching strategy also facilitated the development of a sense of community in this virtual classroom. Cubbon evaluated the learner's perspective on the effectiveness of the exercise. Students reported that the VCR activity provided a safe structured environment in which students could meet one another and engage in a learning exercise as joint participants. This resulted in a bonding and a sense of team spirit that Rovai (2002a) notes as an essential element of establishing a sense of community online.

The students also reported that they enjoyed the social aspects of the learning activity and described it as an enjoyable way to interact with another student online (Cubbon, 2008). According to the COI model, this element of social presence, that seemed to be stimulated by the VRC, has a direct influence on each student's educational experience. See Appendix C for an example of the virtual reflective center teaching technology.

Future Trends

In this section we discuss what we see as future and emerging trends related to interactive teaching technologies in online education in any field of study. Subtopics include the fast paced evolution of computer-mediated teaching platforms and the need for programs of related research**.**

Evolution of Learning Platforms, Technologies, and Resources

New computer-mediated learning platforms are under development and current platforms are modified and versioned frequently. The opportunity exists for online instructors to easily make changes to the course readings, assignments, and syllabus. Sometimes such changes are made out of necessity: for example, hyperlinks to key online resources go dead unexpectedly. In other instances, changes are made in an attempt to provide students with the most current readings on a topic. Because the resources used in online teaching are primarily electronic, the ease with which they can be amended or removed from a course provides both a temptation to the teacher and an expectation from the students. This is a trend that is likely to continue.

Perhaps the future holds the possibility of individualized or customized online courses tweaked to meet the specific needs and learning style of each student.

With the advent of new interactive teaching technologies, the potential for even more "real" interactions between students, and between student and teacher, is likely. The use of wikis, blogs and social networking sites have only been minimally explored from an educational perspective but these are widely used outside education. Brett, Audrey and Brooks (2008) researched the use of Web blogging as a teaching tool in higher education and found that is has potential but that the development of this strategy is in the early stages. Rounds and Rappaport (2008) conclude that, "The development of technology and online education has opened the door to creative use of new and existing delivery methodologies" (p. 12). One question is, just because a technology is available should it be put into use as an education tool or strategy?

Education is changing. Methods of information delivery and dialogue are being shaped by technology. The lifestyles of students may be becoming more complex and hectic as they are often juggling several major life roles while studying. Learning has become a life-long pursuit, both for personal satisfaction and for the maintenance of professional competence. The expectations of students may be changing as they expect current, relevant, interesting courses that are available to them at any time via a variety of channels. The effective use of electronic technologies seems essential to address the needs and desires of students. Davidson, Corcoran, Marr, Lin and McGreevy (2008) agree that students require flexibility and they predict that the use of online learning will likely increase. To keep pace with the demands and requirement of the changing learner, the future requires an ongoing evolution of learning platforms and technologies and the continual development and refinement of electronic teaching strategies and resources.

Need for More Research

Although the teaching of many disciplines online is becoming increasingly common, with many universities offering either selected courses or entire programs over the Internet, there is limited published research related to the best practices in the field of effective online pedagogy. The scholarly literature available on this theme relates largely to the experiences of students or descriptions of specific programs (O'Neil & Fisher, 2008). There is limited research on the experience of the teacher in the online teaching environment. Online teaching technologies, such as those discussed in this paper, are interactive (that is ideally they involve authentic engagement

by both the teacher and the learner). The literature reviewed in this paper points to the potential that the online teaching-learning encounter is a mutual experience. Thus research that explores how the use of interactive teaching technologies influences teachers is also needed.

Teaching strategies used in the online environment need to be developed and assessed systematically. Research on specific teaching technologies, and the students' experiences with each, should be undertaken before these approaches are adopted, modified, or discarded. New electronic technologies that impact online education will continue to emerge in the future. Perhaps a generic approach to evaluation of emerging technologies would be helpful. The outcomes of these evaluations would provide a research base from which to make decisions related to inclusion of these technologies in online courses. This research base would also inform the design of new teaching strategies.

Research aimed at the appropriate use of existing and new teaching technologies is also important. In other words, specific technologies may be effective for some students and certain topics, and very inappropriate and ineffective in different situations. It is impossible, and perhaps dangerous to learning, to conclude prematurely that a certain teaching technology is universally "good" or "bad," "effective" or "ineffective." Further specific research taking into account such variables as learning styles, content area, and teaching approach is needed. Research with the purpose of understanding the impact on both the students and the teachers who employ interactive teaching technologies in online learning is suggested.

There exists some research aimed at predicting and enhancing the fit between online students and course design (Brinkerhoff & Koroghlanian, 2007). This theme will likely become of more importance as the technology develops so that personalizing courses is increasingly straightforward. To personalize the delivery of online course content and to be able to match teaching strategies with certain individuals, substantial research is needed. Topics such as what personality, learning style, and lifestyle factors of students influence their preference for certain teaching approaches would be a beginning point.

Teaching in the classroom with a group of students in person may require different teaching strategies from successful online instruction. The experiences of teachers who have made the transition from classroom to online teaching have been studied to a limited extent (Johnson, 2008; Zsohar & Smith, 2008). However, additional research to explore the transposition of selected teaching strategies from the classroom to the online educational

environment would be informative. Research on topics related to the differences and similarities between online and classroom teaching is needed. According to Philip and Nicholls (2007) an online course can be as engaging, interesting, and innovative as any course designed for a more traditional setting. We need to explore existing strategies, and develop new ones, to make this happen.

Conclusion

In this paper, we explored the online teaching technologies of photovoice, conceptual quilting, and virtual reflective centers. These strategies were found to help facilitate the development of virtual learning communities online. Three major philosophical shifts noted by Shea (2006) were identified. These include a shift from objectivism towards constructivism, from behaviorism towards socio-cognitive views of education, and a pedagogical shift from direct instruction to the facilitation of collaborative learning. These changes underlie the importance of developing virtual learning communities to enhance effectiveness of online learning through employing teaching strategies such as those described. While these teaching strategies were initially used in nursing and health studies courses it is likely that the effects of creating community would also occur if they were added to online courses in other disciplines. The content conveyed by the strategy is not as important in this discussion as the affect participating in these strategies has on the sense of community in the group of participating learners. Once community is established in an online class constructivism, social interaction, and collaboration are possible and learning may be facilitated.

The pace of change within the online teaching world at times seems relentless. As this trend is likely to not only continue, but accelerate, it is even more important that scholars and practitioners in the field of online learning carefully investigate their assumptions, practices, and experiences. We discussed the need for systematic programs of research related to the best practices in online education, including specific evaluation of online teaching strategies. Research related to the transposition of teaching strategies from use in the face-to-face classroom to use in the online classroom is needed. We need to also come to a better understanding of the experience of the online teacher in the mutual experience that is said to occur in some online educational encounters.

Interactive teaching technologies have had a substantial positive impact on the teaching of nursing and health studies graduate courses online in our experience. This article may inspire

teacher educators who are teaching online to employ similar strategies to enhance the community experience in their virtual classrooms. The deliberate use of teaching technologies that incorporate social interaction has helped to develop what we call a culture of community in our online classes. This sense of community seems to contribute to positive learning outcomes for the students and a sense of professional fulfillment for the instructors**.**

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Key Terms and Definitions

Community of Inquiry Model – Three overlapping spheres (cognitive presence, social presence and teaching presence), the juncture of which forms the student's educational experience (Garrison, Anderson, & Archer, 2000).

Computer-mediated Communication – Communication or information exchange between two or more people using the Internet or other network connection (Burnett, 2000).

Conceptual Quilting- An online interactive activity in which students are invited to construct a virtual quilt that is comprised of the ideas, metaphors, theories and other details from the course that were the most personally meaningful to them.

Learning Community - A group of online learners who express the four related dimensions of "spirit, trust, interaction, and commonality of learning expectations and goals" (Rovai 2002a, p.12).

Photovoice – An interactive online teaching technology that uses photographic images to initiate student discussions. Photovoice was originally used as a participatory-action research methodology (Wang & Burris, 1997) and modified by Perry (2006) to become a teaching technology.

Social Constructivism- Attributed to Vygotsky, Social Constructivism assumes that knowledge is constructed by students; however emphasis is placed on the importance of interaction with people and social context as it influences learning (Hung, 2001).

Virtual Reflective Centers - Role-playing simulation exercises that are reported to enhance critical thinking and promote social presence online (Ronaldson, 2004).

Appendix A

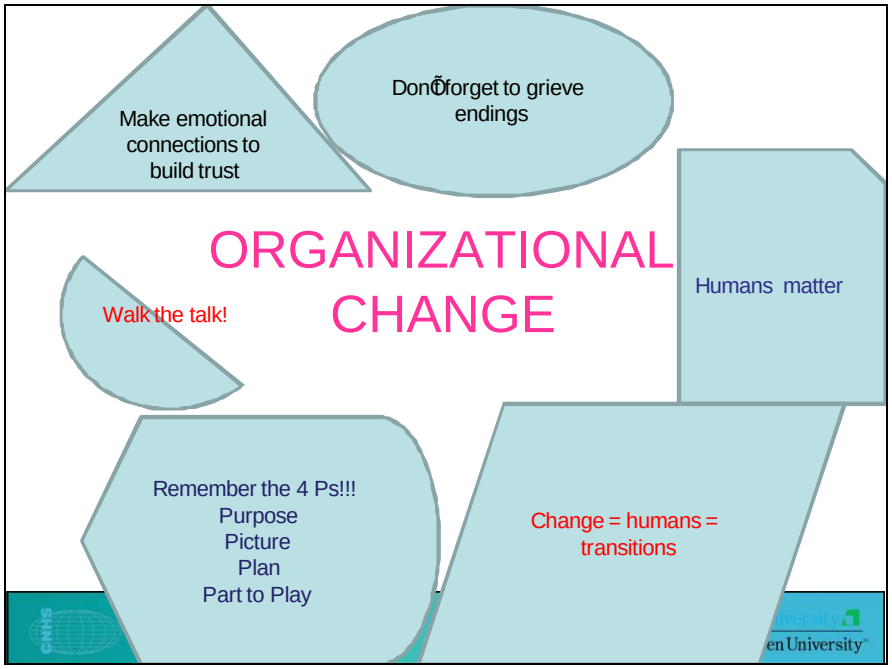
Examples of the Photovoice Teaching Technology

Photo one – Was used in an online course on qualitative research methods. The commentary provided by the instructor that accompanies the photo reads:
Students please consider this photo. In qualitative research the researcher becomes the instrument of data collection. Relate what you see in this image with the importance of qualitative researchers being aware of their viewpoints, biases and perceptions when they become the instrument of data collection.

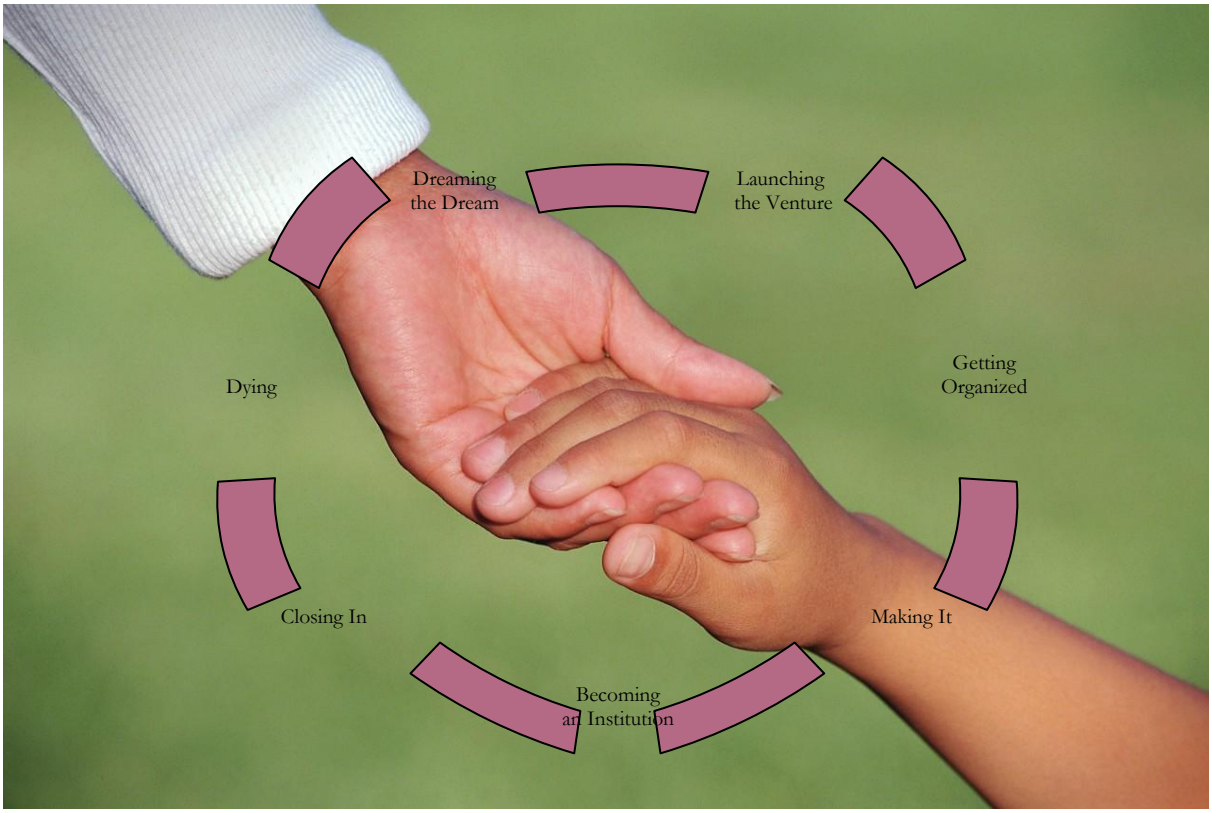
Photo two – Was used in an online course on organizational change. The commentary provided by the instructor that accompanies the photo reads:
Students please consider this photo. People involved in organizational change often experience stages similar to a grief response resulting at least in part from losses associated with letting go of the old and accepting the new. Relate this experience to the fence in this image.

Appendix B

Examples of Conceptual Quilts Developed at the Conclusion of a Course on Organization Change




Keys to Successful Organizational Change
Never loose hope
Acknowledge loss
Teamwork
Positive Attitude


Dreaming the Dream
Launching the Venture
Getting Organized
Making It
Becoming an Institution
Closing In
Dying

Appendix C
Example of a Virtual Reflective Center Teaching Technology

Part One – Patient History

One student (the patient) is provided with access to the following patient outline online.
You are a 65 year old man with a history of congestive heart failure. You have smoked 2 packs a day and are reluctant to quit smoking. You have tried quitting once using the "cold turkey" approach but took up the habit again within days. You are married and your wife nags you to quit. Recently you have experienced some increased shortness of breath and you have some anxiety about your health. You are about 10 kg overweight and eat a diet high in saturated fats.

Part Two – Nurse Role

Another student (the nurse) is provided with access to the following nursing role description online.
You are a working as a public health nurse and a patient comes in to receive his annual seasonal flu immunization. He confides in you that he has increased shortness of breath and that he is concerned about his health status. Interview this patient to determine other risk factors and counsel the patient accordingly.

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