Handbook of Research on Electronic Collaboration and Organizational Synergy

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Chapter XII
Working Collaboratively on the Digital Global Frontier

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ABSTRACT

An international online collaborative learning experience was designed and implemented in preservice teacher education classes at the University of Calgary, Canada and the University of Southern Queensland, Australia. The project was designed to give preservice teachers an opportunity to live the experience of being online collaborators investigating real world teaching issues of diversity and inclusivity. Qualitative research was conducted to examine the complexity of the online collaborative experiences of participants. Redmond and Lock's (2006) flexible online collaborative learning framework was used to explain the design and the implementation of the project. Henri's (1992) content analysis model for computer-mediated communication was used for the online asynchronous postings and a constant comparative method of data analysis was used in the construction of themes. From the findings, the authors propose recommendations for designing and facilitating collaborative learning on the digital global frontier.

INTRODUCTION

Teaching and learning across borders can be accomplished using contemporary information and communication technology (ICT) tools. Online synchronous and asynchronous technologies provide the ability to share ideas, gain multiple perspectives, collaboratively co-create knowledge and develop a collective intelligence. The power of anyone, anywhere and anytime online learning

along with the social and collaborative nature of learning valued in the 21st century creates new learning opportunities.

This qualitative research examines the design and the implementation of an international online collaborative learning experience within preservice teacher education classes in one Canadian and Australian university. The project was launched in 2006 and modified for re-implementation in 2007. The aims of the work were to:

- Model the use of ICTs within teaching and learning;
- Advance educational thought and practice;
- Develop global relationships; and
- Develop an increased understanding of diversity and inclusivity in today's classrooms.

FLEXIBLE ONLINE COLLABORATE LEARNING FRAMEWORK

The conceptual framework for an online collaborative learning environment is grounded in social constructivism. "Social constructivists believe that meaning making is a process of negotiation among the participants through dialogues or conversations" (Jonassen, Peck, & Wilson, 1999, p. 5). With social constructivism "learning is essentially a social activity, that meaning is constructed through communication, collaborative activity, and interactions with others" (Swan, 2005, p. 5). The opportunity to interact with other learners in sharing, discussing, deconstructing, and negotiating meaning leads to knowledge construction.

When designing for knowledge building using a social constructivist approach, the work begins with an understanding of the relationship between pedagogy and technology. ICT tools, such as asynchronous discussion forums, provide a medium for communication and collaboration

to occur. The challenge is to change the focus of teaching and learning from being *about* the technology (e.g., added to practice), to a focus *on* the pedagogy that allows for the creation of new spaces for deep learning in which the technology is purposefully selected and used to enhance and extend learning.
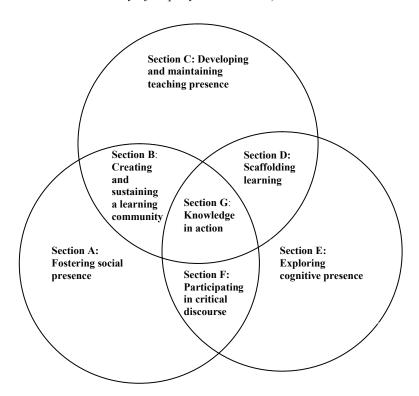
New technologies "demand that educators rethink the nature of their work and the forms of collaboration and communication" (Clifford, Friesen, & Jardine, 2003, p. 1). Given this demand, Redmond and Lock's (2006) online collaborative learning framework, an adaptation of Garrison, Anderson, and Archer's (2000) *Community of Inquiry* model, provides a structure to design online collaboration. Figure 1 shows the relationship between the seven elements of the Redmond and Lock (2006) framework. Later in the chapter, this framework is discussed and used to describe the design and implementation of the online collaborative project for preservice teachers and in discussing the research findings.

RESEARCH DESIGN

For this research, a case study approach provided a means to report in a holistic fashion the authentic online collaborative learning experience of preservice teachers in two iterations of the project and to examine the complexity of the online collaborative experience. The study investigated how preservice teachers in two countries identified and explored critical issues embedded in cultural diversity and inclusion, and inquired into how to honour this diversity in elementary/primary classrooms.

The project occurred over a six-week period in early 2006 and 2007, using a three-phase project design based on the Redmond and Lock (2006) online collaborative learning framework. All students were in face-to-face courses, however the work for this project occurred online using the learning management system, Blackboard™, and videoconferencing. The 2006 case study involved

Figure 1. Redmond and Lock's (2006) online collaborative learning framework (Adapted from the Garrison, Anderson, & Archer community of inquiry model, 1999)

preservice teachers from two of the classes from the University of Calgary, Canada, and one class from the University of Southern Queensland, Australia. A total of 22 preservice teachers participated in the research element of the project. The study was replicated in 2007 with one group from the University of Calgary and four groups from the University of Southern Queensland. A total of 57 preservice teachers participated in the research study.

Three factors were addressed in the 2007 redesign. First, preservice teachers appreciated the videoconferencing opportunity that occurred at the end of the project and recommended a videoconference at the start. As a result, the instructors organized a videoconference at the start and towards the end of the 2007 project. Second, based on the nature of the online discussion in 2006, the instructors facilitated an activity to help preservice teachers develop greater awareness of

quality online postings for the purpose of fostering discourse. Third, a separate content section was placed on the navigation bar in Blackboard™ for the purpose of introducing experts and instructors. Pictures and biographies were available for participants to read before they posted questions and engaged in discourse within the discussion forums.

The study explored the following questions:

• In what ways can international online collaboration promote deep inquiry?
• How can online collaboration promote inquiry into teaching within diverse contexts?

Multiple sources of data were used. First, the main data source for the study was the asynchronous online communication. Second, preservice teachers were invited to participate in a focus-group

interview at the end of the study. Third, data also came from a reflective activity that the participants completed and posted online. Fourth, we, the researchers, were the designers, developers, and facilitators of the project. We had a teaching presence while we fulfilled the roles of being online experts and researchers. We were observers/participants monitoring the various interactions and development of artifacts for the project.

The transcripts from the discussions were analyzed using Henri's (1992) content analysis model for asynchronous computer-mediated communication. It provided a way to conduct analysis of online dialogue both in terms of quality and quantity of messages. The following five dimensions along with specific indicators in Henri's (1992) framework were used in the content analysis:

- **Participative:** Quantity of messages posted by one person.
- **Social:** Statements that are social in nature or are not related to the specific subject matter.
- **Interactive:** Linkages between messages and other sources of information.
- **Cognitive:** Postings of a higher intellectual quality where participants apply, analyze and evaluate information found or provided by others.
- **Metacognitive:** Statements "related to general knowledge and skills and showing awareness, self-control, and self-regulation of learning" (Henri, 1992, p. 125).

We independently coded the data using the dimensions and indicators provided by Henri's (1992) framework. This process was followed by check-coding (Miles & Huberman, 1994) to address the reliability of the analysis. Where the data was coded differently, discussion occurred whereby we came to a mutual decision on the final coding based on justification and negotiation.

The constant comparative method of data analysis was used in the construction of themes through capturing patterns and consistencies from the reflective activity and from focus group interviews. Categories and themes were further analyzed by looking for similarities or differences and areas of conflict in the data.

IMPLEMENTATION AND DISCUSSION OF FINDINGS

In the 2006 and 2007 implementation of the project, data has been shared and findings discussed using the seven elements of the Redmond and Lock (2006) framework. Further, quotes from preservice teacher participants are included and to protect their identity pseudonyms have been used.

Fostering Social Presence

Garrison et al. (2000) define social presence as "the ability of participants in a community of inquiry to project themselves socially and emotionally, as 'real' people though the medium of communication being used" (p. 94). Garrison and Cleveland-Innis (2005) argued that social presence is a precondition to support a purposeful and worthwhile learning experience. This element focuses on non-subject specific discussions where preservice teachers were socializing and getting acquainted. The participants introduced themselves to the broader group and they were asked to reply to a number of their colleagues who were located in different geographical areas. This activity was focused on building rapport.

The total number of introductory postings from 2006 (n=22) as compared to 2007 (n=57) increased from 59 to 252, with the average postings per preservice teacher in 2006 being 2.68 and 4.42 in 2007. The nature of the postings did not change significantly over the two years. Using Henri's (1992) framework, the majority of

postings were identified as interactive or social in nature. This is not unexpected given the nature of the introductory task.

The goal of fostering social presence was to gain a sense of connectivity, community and trust so that everyone could feel free to express ideas, to articulate questions, and to contradict others. One of the preservice teacher noted, "I could freely comment on topics." This is an indication that, at least for this preservice teacher, they felt a level of trust and openness in the online environment. The increase in the average postings per preservice teacher might also support this outcome.

Creating and Sustaining a Learning Community

The creation of community should provide learners with "comforts of home, providing a safe climate, an atmosphere of trust and respect, an invitation for intellectual exchange, and a gathering place for like-minded individuals who are sharing a journey" (Conrad, 2005, p. 2). Communication, collaboration, interaction and participation are four cornerstones of an online learning community (Lock, 2002). Therefore, when designing the online space, careful consideration should be given to how these cornerstones are used to foster growth and sustainability in a community of learners.

In our study, preservice teachers were able to refer to biographies and pictures posted by facilitators and experts as another way of connecting with members of the community. An important role of teaching presence in this phase was to encourage the participants to see themselves and others as individuals and as active members in the learning community.

In addition, in 2007, a videoconference was held at the start of the project that connected all four geographical locations (e.g., one in Canada, and three in Australia) for the purpose of nurturing community development. During the videoconference, icebreaker activities were implemented and the nature of the project was discussed to foster a shared understanding of expectations. They were given the opportunity unpack Henri's (1992) dimensions for analyzing the quality and quantity of online interactions so to develop an expectation of effective online postings.

For most preservice teachers, videoconferencing was a new experience. It was to assist with the development of social presence and group cohesion. Jim commented that through the videoconference it was "easier to express emotions and provide and receive clarity of varying topics." Nick stated, "Incorporation of videoconferences helped to bridge the gap between campuses" these concepts were echoed by a number of their colleagues. However, Sue indicated that the videoconference did little to contribute to her learning and stated, "beyond the novelty factor, I am not sure about the benefits of the videoconferences."

Developing and Maintaining Teaching Presence

Anderson, Rourke, Garrison, and Archer (2001) "define teaching presence as the design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learn-

Table 1. Frequency of preservice teachers online postings in the introduction discussion forum

Year	Number of Participants	Participative	Social	Interactive	Cognitive	Meta-cognitive
2006	22	59	18	41	0	0
2007	57	252	51	203	1	0

incorporated into the design of the class" (p. 191). Teaching presence through the facilitation of discourse was embodied by strategies such as contacting preservice teachers who had limited participation, establishing starter questions that would spark the online discussion, providing examples of constructive online participation, and modeling effective postings during the project. Further, we maintained an ongoing online presence throughout the project and discussed the work in our face-to-face classes to help support the online experience.

Direct Instruction

With direct instruction, according to Anderson, et al. (2001), "teachers provide intellectual and scholarly leadership and share their subject matter knowledge with students" (p. 8). Working in a social constructivist paradigm requires instructors as facilitators to undertake direct instruction through the provision of additional resources, diagnosing and addressing misconceptions, and direct/redirect learning to map onto the key concepts and major learning outcomes (Anderson, et al., 2001).

As instructors it was our role to teach subject matter, structure and model learning and assessment tasks, and provide opportunities for participants to gain multiple perspectives. As online discussions developed, preservice teachers were provided with a range of perspectives, and they could modify their own perspectives in light of new information or the shared experiences of others. Joanne commented:

"I think that it forces those in the discussion to consider ideas and beliefs beyond what they already hold. For myself I find that a willingness to be open to the opinions of others is vital to becoming a successful teacher. If we were to have completed an independent inquiry paper I would not have been forced to examine views beyond what I already hold."

Scaffolding Learning

Scaffolding learning occurs at the intersection of teaching presence and cognitive presence. It is the intentional design of activities that help move learners from social relationships to the development of cognitive relationships designed to foster deep and meaningful learning opportunities.

In an effort to "judge the nature and quality of critical reflection and discourse in a collaborative community of inquiry" (Garrison & Anderson, 2003, p. 60) the practical inquiry model was developed. The model enables student and instructor postings to be mapped against indicators to assess the critical thinking made visible in their postings. In this initial stage, students encounter what Garrison and Anderson (2003) refer to as a triggering event linked to curriculum. The triggering event for this project was to create heterogeneous groupings of preservice teachers who read the same novel. The following three novels were selected:

- *The Curious Incident of the Dog in the Night-time* by Mark Haddon (2002)
- *Group of One* by Rachna Gilmore (2005)
- *Parvana's Journey* by Debra Ellis (2002).

The novels created a catalyst for interaction and also had a clear relationship to the key concepts related to the courses. After reading their selected novel, preservice teachers were asked to create an overview of the book, identify key concepts, and note the relationship between the novel and the K–12 curricula. In addition, they created inquiry questions that were used to further explore diversity and inclusivity.

When reflecting on tasks, Jan indicated the "incorporation of the novel at commencement of the course was a new and interesting idea. I found reference to the novel and key learnings were repeatedly being included in course content."

This was the first opportunity preservice teachers had to make their private thoughts public and to view and respond to a range of ideas coming

from others in different courses and geographical locations. Phil commented "text can be interpreted by different people and the differing ways they reflect on their own experiences." Williams (1998) suggested that online novel studies (e.g., Bookrap):

"provide a different audience for ideas, reviews, questions and answers, than their teacher. The process of articulating to an unknown audience requires more specific use of language and greater articulation of ideas than is usually practiced in an oral conversation."

As seen in Table 2, from 2006 (n=22) to 2007 (n=57) preservice teacher responses in this phase almost doubled. The average total number of postings per preservice teacher increased from 3.23 to 6.22. This substantial increase was seen in all of Henri's (1992) dimensions except for metacognitive. It was disappointing in this area that the number of postings decreased by half rather than increased. We were unable to determine why this decrease occurred, especially given the intentional activity during the first videoconference where participants unpacked Henri's dimensions through the use of examples.

The triggering event, reading the novel and creating an overview to launch the online discussion, was to create discord or stimulate interest in discussing issues that arose from the novels. We felt the novels took the role of stimulating interest. However, Andrew observed that he "was apprehensive about this assignment, I was forced out of my comfort zone and was challenged to learn a new piece of technology to communicate.

I'm glad that I had the opportunity to participate in this experience." It appeared from Andrew's comments and those of many of his peers that the use of technology itself created dissonance.

Exploring Cognitive Presence

Cognitive presence is the "the intellectual environment that supports sustained critical discourse and higher order knowledge acquisition and application" (Garrison & Anderson, 2003, p. 55). "Cognitive presence reflects the intellectual climate and is associated with the facilitation of critical reflection and discourse" (Garrison, 2003, p. 49). Johnson (2006) suggested that asynchronous discussions facilitate "student learning and higher-level thinking skills, perhaps due to the cognitive processing required in writing, time to reflect upon posted messages and consider written responses, and the public and permanent nature of online postings" (p. 51). This concurs with Fred's comment that the project was an "innovative way to deepen my understanding as a student on the topics of diversity; special needs mainly autism, humanity, and inclusive practices."

In the exploration, the second phase of Garrison and Anderson's (2003) practical inquiry model, learners seek further information, brainstorm ideas, consider their own prior knowledge and experience and the knowledge and experience that others share in relation to the triggering event. The triggering event lead into an exploration phase where preservice teachers were seeking further information and brainstorming ideas around the issues that emerged from their initial novel discussions and were exploring ideas and solutions in

Table 2. Frequency of preservice teachers online responses in the novel study and inquiry questions forums

Year	Number of Participants	Participative	Social	Interactive	Cognitive	Meta-cognitive
2006	22	71	0	71	27	6
2007	57	355	1	215	131	3

response to inquiry questions. They often lacked the theoretical and experiential knowledge of the topics as noted in Mandy's words "this required a lot of extra reading time before I could respond." Paul's positive comment also indicated that the learning experience was both innovative and also challenging: "This project really got my thinking bone to do its job. It was something very new to me. I do think overall this project was a credit to my learning and not a complete bore-o-rama."

Participating in Critical Discourse

Critical discourse, the intersection between cognitive presence and social presence, involves the integration and analysis of multiple sources of information used by learners to resolve their feelings of dissonance experienced from the triggering event. It is here that the third phase of the Garrison and Anderson's (2003) practical inquiry model, integration, is addressed. Analysis, construction, deconstruction, and confirmation of meaning occurs at both a personal and public level and include skills such as reflection, analysis, and metacognition. Informed voices engage in dialogue, debate and higher order thinking that influences the learners' future actions and reflections.

Teaching presence supports development of cognitive presence through participation in critical discourse by providing constructive criticism, challenging beliefs, posing further questions, and providing the opportunities for students to self-assess their contributions against criteria (Black, 2005; Fabro & Garrison, 1998; Kanuka & Garrison 2004). As a learning community,

the learners and instructors connect to, critique and build on the ideas of others, as well as begin to provide tentative solutions with justifications through critical discourse.

From the online discussions various topics and issues were emerging that required greater expertise in responding to questions. Various experts were invited to respond to the participants' queries in relation to:

- ICT integration;
- Adaptive and assistive technologies;
- English as a second language;
- Internationalization of education;
- Special needs; and
- Autism.

During this phase, preservice teachers were invited to compare, contrast and connect ideas from other participants and from relevant literature in order to participate with an informed voice and to create new knowledge. Adam reflected that, "a lot of research was required to participate in any forum." It was found that preservice teachers valued the multiple sources of information. For example, Ben commented, "I learnt that personal experience counts as well and I gained invaluable insights from others."

Table 3, shows the four fold increase in average posting per preservice teacher. In 2006 (n=22), the average person's posting was 1.36, as compared to 2007 (n=57) where the average per person posting was 5.58. Interestingly there were some social postings in the 2007 cohort and also the addition of metacognitive postings. Within the postings in the expert forums, there

Table 3. Frequency of preservice teachers' online responses in expert discussion forums

Year	Number of Participants	Participative	Social	Interactive	Cognitive	Meta-cognitive
2006	22	30	0	20	10	0
2007	57	318	7	212	97	2

was evidence that participants were engaged in higher order thinking.

In a study conducted by Hemphill and Hemphill (2007), it was found that "[s]tudents' critical thinking skills and interest levels were enhanced by the presence of the guest speakers" (p. 292) in asynchronous discussions. This aligned with findings in our study. For example, Lesley commented that "I really found the expert forums and the input from 'experts' very helpful." Similar comments were shared by many of their colleagues and was supported by Peter who noted that within the forums a "lot of good advice that was given, along with some really interesting questions, but I benefited most from experts."

Knowledge in Action

Knowledge in action is the culmination of all the work that has occurred in the previous six sections of the online collaborative learning framework. It represents the fourth phase of the practical inquiry model, resolution (Garrison & Anderson, 2003). It is here that learners apply their knowledge, create artifacts, solve problems, or implement an action plan. The resolution phase will often "raise further questions and issues, triggering new cycles of inquiry, and, thereby, encouraging continuous learning" (Garrison & Anderson, 2003, p. 60). It fuels the iterative inquiry cycle.

Knowledge in action was made visible in two ways. First, in the second videoconference, preservice teachers explored scenarios in which they applied what they had learned over the past weeks and were asked to create personal professional development action plans. Within these plans, they identified short and long term learning goals, articulated specific tasks or understandings they would undertake during their next field placement or school experience placements. Second, preservice teachers concluded the project with a written reflection based on their overall educational experience during the project. Albert revealed that "it has been of great interest to see changes in my

personal teaching pedagogy and preparation for an up-coming prac[practicum]....directly related to my learnings from this course."

A number of participants commented that the project assisted them in gaining knowledge and experience in how they might use a novel study, integrate ICTs and bring experts into their classrooms. For example, Jerry reflected that:

"I enjoyed the challenge that this project gave me. I also think that this project gave me a new insight into teaching with technology. I would be interested as a teacher to find ways to use a similar discussion forum to allow students in my class to learn about cultures in the world and to develop their ability to become a global citizen."

The overall view of the project was best summed up by Terry:

"I gained experience using a different mode of electronic communication and it was unique experience and although challenging, and sometimes frustrating, I have had opportunities to hear the view of many different people about inclusive education in a way that would not normally have been possible."

Final Comments

Although the reflective comments from preservice teachers were overwhelmingly positive and participation was high, there were also some comments that indicated that preservice teacher participation was not at levels that they would have preferred. For example, Mary mentioned, "I was unable to contribute as much as I would have liked to." This corresponds with what Pena-Shaff, Altman, and Stephenson's (2005) findings that indicated "[s]ome students noted lack of time as a reason for not participating more actively, even when they enjoyed the discussions" (p. 425).

The use of online collaborative learning was a new experience for many preservice teachers. Some commented they were unable to keep up with the amount of postings and were confused by the layout of discussion threads. The increase in the number of postings was exacerbated because the preservice teachers were encouraged to lead discussion into areas that were of personal interest to them. Bob suggested that another factor which impacted participation was the "[i]ncreased workload/pressure for some who were students lacking ICT skills and the project was limited to a short period." In the next iteration of the project, these challenges need to be addressed in the design and facilitation of the online collaborative work.

Limitations of the Study

There were two major limitations in the study. First, there was a low response rate. This may be attributed to how students were invited to participate in the study (e.g., e-mail invitation and unknown research assistant presenting the research opportunity). Further, given the heavy workload and the timing of the research in the semester, preservice teachers may have viewed research participation as additional work and opted to remain focused on course work. Second, data were collected from preservice teachers and an untapped data source is that of experts, faculty members, who shared their expertise in the discussions. Having an opportunity to interview experts and analyze their online discussions may provide greater insight into the learning experience.

RECOMMENDATIONS

From the two iterations of the project, we propose six recommendations in the following two areas to assist educators in creating and facilitating online collaborative learning.

Design of Online Collaborative Work

We present four recommendations for designing online collaborative work. First, to foster greater interaction and quality online discussion that supports meaningful learning begins with purposeful selection and implementation of innovative instructional methods. "In order for meaningful learning to occur, the task that students pursue should engage active, constructive, intentional, authentic, and cooperative activities" (Jonassen, Howland, Marra, & Crismond, 2008, p. 2). According to Kanuka, Rourke, and Laflamme (2007), instructional methods influence the quality of students' contributions to online discussions. Further, high-level questions need to be asked in the online discussions to foster constructive thinking (Bender, 2003).

Second, there is a need to align goals of the authentic learning experience with authentic assessment strategies. Lombardi (2007) has recommended various design elements to be addressed when creating authentic learning environments (e.g., real-world relevance, collaboration and integrated assessment).

Third, to develop and sustain an online learning community requires the focus to be on "the whole group, which should then collaborate and support each other towards their learning goals …This model depends on both students and teacher taking responsibility for their learning and motivation" (Jonassen, Peck, & Wilson, 1998, p. 2). Rovai (2002) noted that if instructors believe their job is done after they create and put the course online the result is that the "sense of community will whither unless the community is nurtured and support is provided in the form of heightened awareness of social presence." Instructors need to understand what makes a learning community and appreciate their dynamic role to strengthen and support the community.

Fourth, adequate time is required for responding and reflecting both in the design of the work and

by providing the appropriate technology. Adequate time should be provided to allow online participants the opportunity to work collaboratively. They need time to arrange how the work will be completed, as well as have time to work independently and collaboratively. Further, designers need to draw from the lessons learned from scholarly literature in areas of computer-mediated communication and online learning environments to guide the selection and use of various ICT applications that are appropriate to support collaborative and active learning environments (e.g., synchronous for quick problem-solving and asynchronous communication when time is needed to reflect).

Facilitation of Online Collaboration

When facilitating online collaboration, we share two key recommendations. First, online instructors and experts or guests need to develop an understanding and a skill set in facilitating online discussions. According to Collison, Elbaum, Haavind, and Tinker (2000), three roles of a facilitator are: guide on the side, instructor or project leader, and group process facilitator. In each of these roles, facilitators must develop skills and confidence in moderating online discussions, in asking questions to provoke critical thinking and in responding so to foster dialogue.

Second, participants in the online collaborative learning environment need to understand the expectations of the learning tasks and discussions. When facilitating online collaborative work, the established expectations need to guide the work of all participants. Bender (2003) has advocated for instructors to clearly define expectations and they need to encourage students to be active learners. This may require teaching students to moderate a discussion, to ask open-ended questions to generate rich conversation and to respond in a manner that nurtures dialogue. By developing online facilitation skills among all participants, it allows people to share expertise and experience, to collaborate and to co-construct knowledge.

FUTURE TRENDS

Our challenge as teacher educators is to help preservice teachers to develop an understanding of the relationship between technology and pedagogy so they can design and facilitate deep learning in technologically enhanced environments. They need to have rich experiences of how technology can be used to support meaningful learning in the 21st century global classroom.

From the study, three trends have emerged. First, as educators, we need to continue to find ways to move learning onto the digital global frontier so all stakeholders develop a deeper understanding of global relationships and to help nurture global citizenship. In a discussion on communities of learners, Jonassen et al. (2008) argued, "[s]eeing the world through another's lens expands each individual's worldview and lays the foundation for respectful, collaborative working relationships as students grow into the adult workers and leaders of tomorrow" (p. 135).

Second, acknowledging the current focus on social software and social networking, how can they be combined with various technologies accessible in classrooms to support student learning? Given the investment in ICTs, teacher educators need to help preservice teachers to explore ways to use various technologies and applications that best support learning outcomes such as critical and creative thinking, communication, collaboration, and problem solving.

Third, the challenge is to design learning that effectively and appropriately integrates a blend of technologies that allow stakeholders to create learning networks of people who share mutual interests. As we design collaborative learning opportunities, we need to determine what can be done best online and how to facilitate that experience, and at the same time determine what is best done in the face-to-face environment to support learning. In our classrooms and through the use of technology, we now design learning experiences for these two learnscapes which merge into one.

CONCLUSION

To move learning onto the digital global frontier requires an intentional and flexible design that fosters collaborative learning. From our experience, we have developed a greater understanding of the nature of the learning experience and the capacity of knowledge building. It is our hope that the preservice teachers who were involved in the project have the confidence to design innovative learning experiences with technology for their students and to bring the world into their classrooms.

What happens to learning when classrooms are no longer defined or confined by the physical space but are open to a digital landscape where people who share mutual interests come together to learn? Welcome to digital global frontier.

REFERENCES

Akin, L., & Neal, D. (2007). CREST+ Model: Writing effective online discussion questions. *MERLOT Journal of Online Learning and Teaching, 3*(2), 191–202.

Anderson, T., Rourke, L., Garrison, D.R., & Archer, W. (2001). Assessing teacher presence in a computer conferencing context. *Journal of Asynchronous Learning Networks, 5*(2). Retrieved July 3, 2008, from http://www.aln.org/publications/jaln/v5n2/pdf/v5n2_anderson.pdf

Bender, T. (2003). *Discussion-based online teaching to enhance student learning: Theory, practice and assessment.* Sterling, VA: Stylus Publishing.

Black, A. (2005). The use of asynchronous discussion: Creating a text of talk. *Contemporary Issues in Technology and Teacher Education*, *5*(1), 5–24.

Clifford, P., Friesen, S., & Jardine, D. (2003, December 3–6). Collaboration in teacher education: Cultivating an inquiry stance. In *Proceedings of mICTE 2003 Multimedia, Information and Communication Technologies, Badajoz, Spain.* Retrieved July 3, 3008, from http://www.galileo.org/research/publications/collaboration_tchr_ed.pdf

Collison, G., Elbaum, B., Haavind, S., & Tinker, R. (2000). *Facilitating online learning: Effective strategies for moderators.* Madison, WI: Atwood Publishing.

Conrad, D. (2005). Building and maintaining community in cohort-based online learning. *Journal of Distance Education, 20*(1), 1–20.

Ellis, D. (2002). *Parvana's journey.* Toronto, Ontario: Groundwood Books.

Fabro, K., & Garrison, D.R. (1998). Computer conferencing and higher-order learning. *Indian Journal of Open Learning, 7*(1), 41–53.

Garrison, D.R. (2003). Cognitive presence for effective online learning: The role of reflective inquiry, self-directed learning and metacognition. In J. Bourne, & J.C. Moore (Eds.), *Elements of quality online education, Practice and direction* (pp. 47–58). Needham, MA: Sloan Centre for Online Education.

Garrison, D.R., & Anderson, T. (2003). *E-learning in the 21st Century: A Framework for Research and Practice.* New York: RoutledgeFalmer.

Garrison, D.R., Anderson, T., & Archer, W. (1999). Critical thinking in a text-based environment: Computer conferencing in higher education. *Internet and Higher Education, 2*(2–3), 87−105.

Garrison, D.R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education 2*(2–3), 87–105.

Garrison, D.R., & Cleveland-Innes, M. (2005). Facilitating cognitive presence in online learning: Interaction is not enough. *American Journal of Distance Education, 19*(3), 133–148.

Gilmore, R. (2005). *A group of one*. Markham, Ontario: Fitzhenry and Whiteside.

Hadden, M. (2002). *The curious incident of the dog in the nighttime*. Toronto: Doubleday Canada.

Hemphill, L.S., & Hemphill, H.H. (2007). Evaluating the impact of guest speaker postings in online discussions. *British Journal of Educational Technology, 38*(2), 287–293.

Henri, F. (1992). Computer conferencing and content analysis. In A.R. Kaye (Ed.), *Collaborative learning through computer conferencing: The Najaden Papers*, (pp. 117–136). Berlin: SpringerVerlag.

Johnson, G. (2006). Synchronous and asynchronous text-based CMC in educational contexts: A review of recent research. *TechTrends, 50*(4), 46–53.

Jonassen, D.H., Howland, J., Marra, R., & Crismond, D. (2008). *Meaningful learning with technology* (3rd. ed.). Upper Saddle River, NJ: Pearson Education, Inc.

Jonassen, D.H., Peck K.L., & Wilson, B.G. (1998). Creating technology-supported learning communities. Retrieved July 3, 2008, from http://carbon.cudenver.edu/~bwilson/learncomm.html

Jonassen, D.H., Peck, K.L, & Wilson, B.G. (1999). *Learning with technology: A constructivist perspective*. Upper Saddle River, NJ: Prentice Hall, Inc.

Kanuka, H., & Garrison, R. (2004). Cognitive presence in online learning. *Journal of Computing in Higher Education, 15*(2), 21–39.

Kanuka, H., Rourke, L., & Laflamme, E. (2007). The influence of instructional methods on the quality of online discussion. *British Journal of Educational Technology, 38*(2), 260–271.

Kowch, E., & Schwier, R. (1997). Considerations in the construction of technology-based virtual learning communities. *Canadian Journal of Education Communication, 26*(1), 1–12.

Lipman, M. (1991). *Thinking in education*. Cambridge: Cambridge University Press.

Lock, J.V. (2002). Laying the groundwork for the development of learning communities within online courses. *The Quarterly Review of Distance Education, 3*(4), 395–408.

Lombardi, M.M. (2007). Authentic learning for the 21st century: An overview. *EDUCAUSE Learning Initiative*. Retrieved July 3, 2008, from http://www.educause.edu/ir/library/pdf/ELI3009.pdf

Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks: SAGE Publication.

Pena-Shaff, J., Altman, W., & Stephenson, H. (2005). Asynchronous online discussions as a tool for learning: Students' attitudes, expectations, and perceptions. *Journal of Interactive Learning Research, 16*(4), 409–430.

Redmond, P., & Lock, J.V. (2006). A flexible framework for online collaborative learning. *The Internet and Higher Education, 9*(4), 663–678.

Rovai, A.P. (2002). Building sense of community at a distance. *International Review of Research in Open and Distance Learning, 3*(1). Retrieved July 3, 2008, from http://www.irrodl.org/index.php/irrodl/article/view/79/153

Swan, K. (2005). A constructivist model for thinking about learning online. In J. Bourne, & J. C. Moore (Eds.), *Elements of Quality Online Education: Engaging Communities*. Needham, MA: Sloan-C. Retrieved July 3, 3008, from http://www.kent.edu/rcet/Publications/upload/constructivist%20theory.pdf

Williams, M. (1998). Online teachers: Interpreting the new spaces. *Interpretations: Journal of the Australian English Teachers Association, 31*(2),

41–52. Retrieved July 3, 2008, from http://www.teachers.ash.org.au/williams/writing98/interpretations.rtf

Wiske, M.S., Franz, K.R., & Breit, L. (2005). *Teaching for understanding with technology*. San Francisco: Jossey-Bass.

KEY TERMS

Cognitive Presence: "The intellectual environment that supports sustained critical discourse and higher order knowledge acquisition and application" (Garrison & Anderson, 2003, p. 55) of the learner.

Collaboration: "Involves interactions with other people, reciprocal exchanges of support and ideas, joint work on the development of performances and products, and co-construction of understandings through comparing alternative ideas, interpretations, and representations" (Wiske, Franz, & Breit, 2005, p. 105).

Community: "A social organization of people who share knowledge, values and goals" (Jonassen et al., 2008, p. 134).

Community of Inquiry: Where "students listen to one another with respect, build on one another's ideas, challenge one another to supply reasons for otherwise unsupported opinions, assist each other in drawing inferences from what has been said, and seek to identify one another's assumptions" (Lipman, 1991, p. 15).

Learning Communities: "Communities are collections of individuals who are bound together by shared ideologies and will, so a learning community emerges when people are drawn together to learn. Although learning communities emphasize outcomes in education, their power resides in their ability to take advantage of, and in some cases, invest a process for learning" (Kowch & Schwier, 1997, p. 1).

Social Presence: "The ability of participants in a community of inquiry to project themselves socially and emotionally, as 'real' people though the medium of communication being used" (Garrison et al., 2000, p. 94).

Teaching Presence: "The design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (Anderson et al., & 2001, p. 5).