

International Online Collaboration: Modeling Online Learning and Teaching

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Abstract

Working through an inquiry process within an international online classroom, pre-service teachers identified and discussed critical issues embedded in cultural diversity and inclusion and explored how to honour diversity within their pedagogical practices in elementary/primary classrooms within Canadian and Australian contexts. A discussion of the findings based on a qualitative research case study is presented through the lens of an online collaborative framework. The role of teaching presence within the intentional design and throughout the implementation of the online collaborative educational experience is paramount. If the goal is to engage pre-service teachers in higher order thinking within online collaborative learning environments, the intentionality of the design of the work and the facilitation of the discourse throughout the work must be modeled and facilitated by educators.

Keywords: Learning and Technology, Learner-centred, Online Collaboration, Use of Learning Spaces, Design of Learning Spaces, Teaching Diverse Students

Introduction

The social and collaborative nature of learning is important in education in the 21st century. Teacher educators have a role to play in designing and implementing collaborative learning based on the needs of the learners and tapping into the world beyond the textbook and artifacts within their classrooms. Moving learning outside of the classroom can provide learners with experience working and learning within international forums and the opportunity to develop an appreciation for multiple perspectives as they examine common issues from various locations.

The qualitative study reported in this paper examines how an international online collaborative learning experience was designed and implemented within three pre-service teacher education classes in two universities located in the northern and southern hemispheres. The project was designed to give pre-service teachers an opportunity to live the experience of being online collaborators investigating real

world issues of diversity and inclusion from both Canadian and Australian perspectives. In addition, it provided them with a model of information and communication technology (ICT) that can be used in their own teaching practice.

The educational experience reported in this study is examined through the lens of Redmond and Lock's (2006) flexible online collaborative learning framework. Their framework is an adaptation of Garrison, Anderson and Archer's (2000) Community of Inquiry model where the educational experience is the nexus of social presence, cognitive presence and teaching presence. An elaboration and application of the elements in the framework are examined further in this paper indicating that the heart of a community of inquiry is creating knowledge in action through the educational experience.

Review of the Literature

Teachers and teacher educators require models of how ICT can be appropriately integrated into rich learning experiences. Clifford, Friesen and Jardine (2003) have argued that "these new technologies demand that educators re-think the nature of their work and the forms of collaboration and communication" (p. 1). Jonassen, Peck and Wilson (1999) have noted that meaningful learning with ICT should be used for generative processing by the learner in constructing knowledge rather than a medium to deliver instruction.

Intentional planning of rich learning experiences which integrate ICT and where all educators (pre-service teachers, in-service teachers and teacher educators) have the potential to learn as a result of critical discourse, metacognitive awareness and development of knowledge in and through action requires consideration of the three C's: constructivism, collaboration and critical thinking.

Constructivism

Online learning has moved from a teacher-directed and static content environment to a constructivist environment that is learner-centred and collaborative. The underlying principle of constructivism is that learners "construct their own understandings of the world in which they live" (Sergiovanni, 1996, p. 38). "Social constructivism reminds us that learning is essentially a social activity, that meaning is constructed through communication, collaborative activity, and interactions with others." (Swan, 2005, p. 5).

Scardamalia and Bereiter (2003) have suggested that much of what occurs in practice under the name of constructivism is shallow rather than deep constructivism. They argue that a shallow approach has learners complete and describe their learning activities. It results in them showing "little awareness of the underlying principles that these tasks are to convey" (p. 1371). In contrast, deep constructivism occurs when "...practices such as identifying problems of understanding, establishing and refining goals based on progress, gathering information, theorizing, designing experiments, answering questions and improving theories, building models, monitoring and evaluating progress, and reporting are all directed by the participants themselves" (Scardamalia & Bereiter, 2003, p.1371).

Inquiry-based learning is a popular constructivist approach to teaching and learning. According to the Galileo Educational Network (2004), inquiry is "a dynamic process of being open to wonder and puzzlement and coming to know and understand the world." It is characterized by curiosity, exploration, risk taking, critical and creative thinking in authentic situations with real audiences. Jacobsen (2001) has stated that "inquiry is an iterative and disciplined cycle of research, reflection, writing, and revising ones knowledge and understanding of a phenomena under study" (p. 17). Within an inquiry approach information comes in and from many forms including dialogue with colleagues. Lock and Clark (2004) have pointed out that "(t)he opportunity to interact and work with others in questioning, sharing, discussing, constructing and negotiating meaning leads to knowledge construction" (p. 3). It is expected that teachers design and facilitate socially constructed learning experiences where students create new knowledge.

Collaboration

The process of “sharing and generating new knowledge together with one’s peers” (Slotte & Tynjälä, 2005, p. 193) as part of a learning community is known as collaboration. Effective 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).

Haythornthwaite (2006) suggested that characteristics of online collaboration include “knowledge creation, group learning, development and maintenance processes, computer-mediated communication, and the presentation of these issues in online learning environments.” Key facets of online collaborative learning include the seamless integration and infusion of technology into the classroom (Good, O’Connor & Luce, 2004). However, Riel (1996) stressed that online communities are defined by the relationships between the participants rather than the technology being used.

Harris (1999) recommended that curriculum-based online collaborative work should have one or more of the following goals:

- “being exposed to differing opinions, perspectives, beliefs, experiences and thinking process;
- comparing, contrasting, and/or combing similar information collected in dissimilar locations;
- communication with a real audience using text and imagery; and
- expanding their global awareness” (p. 55).

Johnson and Johnson (1994) have indicated that online collaboration can enhance learners’ understanding about and appreciation of diversity. As our pre-service teachers step into today’s diverse and inclusive classrooms, they also need models for practice to move from the rhetoric of what an inclusive classroom should be like to the reality of how to teach in and about diverse classrooms.

Critical Thinking

Abrams (2005) has drawn a parallel between collaboration in asynchronous computer mediated communication and critical thinking. “Working with a group of equal-status peers to solve a problem is particularly conducive to the development of critical thinking skills because it exposes individuals to different perspectives and interpretations of a problem or idea” (p. 26).

Slotte and Tynjälä (2005) have explained that collaboration provides opportunities for learners to develop “higher-order thinking skills and problem-solving skills in the construction of their ideas about practice” (p. 193). Newmann and Wehlage (1993) defined higher-order thinking as the ability to “manipulate information and ideas in ways that transform their meaning and implications, such as when students combine facts and ideas in order to synthesize, generalize, explain, hypothesize, or arrive at some conclusion or interpretation” (p. 9).

A text-based online environment enables dialogue beyond surface communication to a reflective exchange of information and ideas. Time and space flexibility provide opportunities for in-depth investigation or analysis, and for participants to compare and contrast beyond the superficial level. Online collaborative learning environments facilitate higher order thinking that provides “the capacity to go beyond the information given, to adopt a critical stance, to evaluate, to have metacognitive awareness and problem solving capacities” (McLoughlin & Luca, 2000).

Metacognitive awareness is knowing and regulating how you learn. According to Henri (1992), metacognitive skills are “procedural knowledge relating to evaluation, planning, regulation and self-awareness” (p. 131). He also suggested that these skills are rarely expressed in traditional learning and teaching environments, however they may be more apparent in text-based dialogue.

The permanent record of the online communication provides participants with the opportunity to engage in dialogue with other members of the learning community over time. This time allows participants to gather additional information from research and to give reasoned and reflective responses, rather than the spontaneous comments which characterize verbal communication. Wiske, Franz and Breit (2005) revealed that “(r)eflection can be accomplished alone, but its contribution to learning is often enhanced by working with others on the process... Peers help one another express their ideas, compare alternative interpretations, and learn from seeing multiple approaches to products and performances” (p. 105). The text-based asynchronous communication provides opportunities for learners to be critical thinkers and engage in metacognitive processing.

Conceptual Framework

Harris (2000-01) argued that we need “new, flexible frameworks that we can use to structure understanding-focused learning activities that help students make powerful, worthwhile use of online tools and resources” (p. 52). Redmond and Lock’s (2006) conceptual framework provides educators with a model for designing, developing and implementing learning experiences where learners create and apply knowledge in action within online collaborative environments. The framework is an adaptation of Garrison, Anderson and Archer’s (2000) Community of Inquiry model and is used to examine the international online collaborative learning experience. Garrison (2003) stated the “(t)rue communities of inquiry are possible through collaborative and reflective communication” (p. 48). Figure 1 illustrates the relationship of the seven elements within the online collaborative framework.

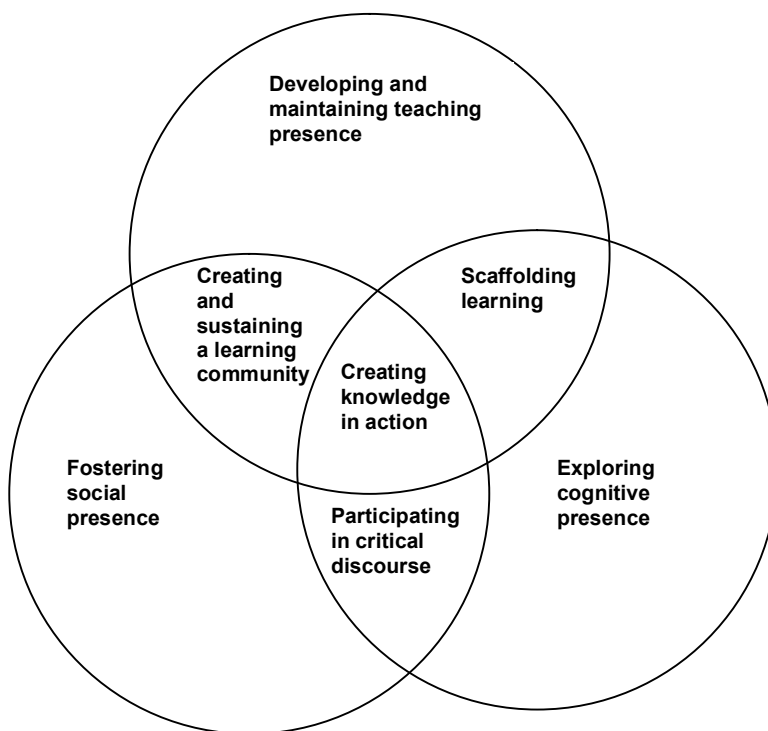


Figure 1: Online collaborative framework (Redmond & Lock, 2006)

Teaching presence, as defined by Anderson, Rourke, Garrison and Archer (2001) is “the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes” (p. 5). Teaching presence needs to be

developed over the course of the project to achieve knowledge in action. It anchors the other six elements of the online collaborative framework.

Social presence is defined by Garrison, Anderson and Archer (2000) as “the ability of participants in a community of inquiry to project themselves socially and emotionally, as ‘real’ people (i.e., their full personality), through the medium of communication being used” (p. 94). The online environment needs to be a safe place for participants to express their thoughts and experiences and where all perspectives are valued and accepted to promote sustained critical discourse.

A *learning community* in the online environment is defined by Conrad (2005) as a “general sense of connection, belonging, and comfort that develops over time among members of a group who share purpose or commitment to a common goal” (p. 2). The community within online collaborative learning is initially created through teaching presence where the educator intentionally plans activities that promote social presence and a sense of belonging. All participants within a learning community have a role in sustaining and nurturing the learning community enabling critical discourse that is crucial to collaborative learning.

Scaffolding learning occurs where teaching and cognitive presences intersect. It is the intentional design of tasks which move learners from social relationships to the development cognitive relationships. This can occur using a triggering event linked to the curriculum where the learners share a common experience or experience a feeling of dissonance.

Cognitive presence is an exploration phase where learners are gathering, confirming and sharing information from a range of sources. This includes dialogue where learners deconstruct their own experiences, brainstorm ideas and question themselves and others. Garrison, Anderson and Archer (2001) see cognitive presence “as the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse in a critical community of inquiry” (p. 11).

Critical discourse is characterized by the integration and analysis of information from multiple sources. Learners use this knowledge to begin to resolve their initial feeling of dissonance experienced from the triggering event. It is here where dialogue with an informed voice and higher order thinking influences proposed future actions and reflection.

Knowledge in action is the goal of online collaborative learning experiences. It is the centre of the framework and is the culmination of all the work that has occurred previously. Learners apply their knowledge conceptually or within the real world. This should provide opportunities for learners to further explore new questions that emerge from the work and foster the iterative inquiry cycle.

The Study

Working through an inquiry process within a global digital classroom, pre-service teachers identified and explored critical issues embedded in cultural diversity and inclusion, and investigated how to honour diversity within elementary/primary classrooms. A major goal of the work was to provide a foundation for pre-service teachers in two countries to engage in critical discourse leading to a deeper understanding of diversity and inclusion and modeling the use of online teaching and learning. The three-phase online collaborative project occurred within a six week period. Although all students were in face-to-face courses, the work for this learning experience occurred online using Blackboard™, an online course management system.

Given the exploratory nature of the research, a case study approach was selected. Yin (1984) defined case study as “an empirical study that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; in which multiple sources of evidence are used” (p. 23). The case study approach has provided a means to report in a holistic manner the authentic online collaborative learning experience. “The interest is in the process, rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation”

(Merriam, 1998, p.19). This qualitative approach therefore provides a useful method for examining the complexity of the online collaborative experience of the participants.

The following questions framed the research:

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

Methods

The Sample

The undergraduate participants of the study were from two-seminar classes from the Master of Teaching Program from University of Calgary, Canada and a class from the Bachelor of Education Program from the University of Southern Queensland, Australia. All pre-service teachers were required to participate in the work as part of the regular course and all were invited to participate in the research. Twenty-two of 41 pre-service teachers volunteered to participate in the research component of the learning experience.

Data Collection

In a case study, Creswell (1998) recommends to gather data from multiple sources. The predominate data source was the asynchronous online communication within Blackboard™ discussion forums. In addition, two pre-service teachers volunteered to respond to the interview questions at the end of the study. Further, the researchers, who were also the Canadian teacher educators, were participant observers who monitored and facilitated the various interactions and the development of artifacts.

Data Analysis

The online discussions were analyzed using Henri's (1992) content analysis model for asynchronous conferencing in computer-mediated communication. His model was used to analyze the level of participation and the nature of the interaction between participants using the following five dimensions: participation, interaction, social, cognitive and metacognitive. Within Henri's model, the participative dimension quantifies the number of messages sent by a participant within a forum. The social dimension looks at how participants create a sense of belonging within the learning community. Postings within this dimension are not related to the formal course context (e.g., self-introductions). The interactive dimension can include independent content statements which stand alone or are in response to or provide commentary on other messages. The cognitive dimension of the model includes postings which clarify, infer, judge or propose strategies. The final dimension, metacognitive, is where self-awareness and self-regulation of knowledge, skills and learning is expressed by the learner (Henri, 1992).

In addition, the constant comparative method of data analysis was used in the study. This analysis was used in the construction of themes through capturing patterns and consistencies. The data were coded by categories based on each of the phases of the study. Categories and themes were further analyzed by looking for similarities or differences within the data. These were continually defined and redefined as they emerged throughout the course of the data analysis.

Integrity of Data in the Study

Two techniques were used to ensure the integrity of data in the study. First, triangulation strengthens the internal validity of the study because it involved "using multiple investigators, multiple sources of data or multiple methods to confirm the emerging findings" (Merriam, 1998, p. 204). In the study, data were gathered through asynchronous communication, interviews and observations. Second, in their examination of methodological issues, Rourke, Anderson, Garrison and Archer (2001) found that Henri's (1992) work evaluating online discussions did not report reliability. In addressing this concern, the researchers have check-coded (Miles & Huberman, 1994) the data by coding and comparing their coding results.

Findings and Discussion

The findings of the study are shared and discussed based on the three phases of the project and in conjunction with the corresponding elements of the conceptual framework.

Phase One: Developing Community and Scaffolding Learning

Expectations of the work

Development of an online environment that nurtures open communication and positive rapport was critical for the success of this international project. Developing relationships among stakeholders within an online learning environment can be a challenge and does take time. Before pre-service teachers could engage in the academic content of the project, the teacher educators provided a space and time for them to become comfortable sharing information and working with colleagues which they may not meet in a face-to-face environment. Therefore, the project began with the pre-service teachers within both Faculties of Education having the opportunity to introduce themselves in an online discussion forum.

The triggering event for the learning experience was the commencement of an online novel study, using a book rap framework. Within each of the three classes, mixed groups were created based on the novels:

- *The Silent Boy* by Lois Lowry (2002) - The story of a girl who tries to befriend a young boy who lacks communication skills and is unable to function socially within a rural community the early 1900's.
- *The Curious Incident of the Dog in the Night-time* by Mark Haddon (2002) - The story is written through the eyes of a fifteen year old boy with Autism and gives the reader a perspective of the world which most of us will never experience.
- *Group of One* by Rachna Gilmore (2005) - A Canadian teenager, who is a daughter of immigrants from India, struggles to align her ethnicity and family heritage with her Canadian identity.
- *Parvana's Journey* by Debra Ellis (2002) - The story of a young girl's survival after the death of her father in Taliban controlled Afghanistan.

Within their class groups, pre-service teachers created a brief novel overview, identified major issues from the novel relevant to a global society and diverse classroom, noted links to curriculum, and created inquiry questions. After each group posted their overview, the teacher educators' adapted these inquiry questions and posted them for the participants to begin their mixed group discussions on issues of diversity and inclusion.

Findings

The initial development of social presence occurred through the introduction activity which launched the project. Twenty-two pre-service teachers participated in the research study. The research participants posted 59 messages in the introduction discussion forum. Using Henri's (1992) five dimensions, the researchers noted eighteen social postings were situations where pre-service teachers introduced themselves to the others within the project. Forty-one of the postings were interactive, where students responded to the postings of their colleagues (Table 1). As expected, there were no postings classified as cognitive or metacognitive. It was in this forum that the pre-service teachers began to become comfortable communicating online and develop their online presence as part of a community of inquiry.

Table 1. Phase One Frequency of Pre-service Teachers Online Responses in the Introduction Forum

	Participative	Social	Interactive	Cognitive	Metacognitive
Number of postings	59	18	41	0	0

Through the book rap conversation, which was the triggering event for the educational experience, pre-service teachers shared their personal views and experiences and explored issues relevant to teaching.

The research participants (n=22) posted 71 messages (Table 2). The majority posted interactive messages in direct response to the task of writing the book summary. However, many postings in this forum were in response to questions asked as a result of the novel overview or in response to colleagues' postings. Of these postings, 27 were classified as cognitive (e.g., asking further questions or self-questioning) and six were metacognitive. One pre-service teacher commented that "Being able to see the world through Christopher's eyes has really changed the way that I see the world... It changes the way that I view other people in that I am less quick to judge."

Table 2. Phase One Frequency of Pre-service Teachers Online Responses within Book Rap Forum

	Participative	Social	Interactive	Cognitive	Metacognitive
Number of postings	71	0	71	27	6

The following four themes emerged from the book rap data: contextualization of the issues, interpretation of the public perception, personal experience, and role of the teacher and/or school. First, in the contextualization of the issues, for participants exploring the topic of cultural diversity, they shared definitions, information about what it means to be Canadian or Australian, and concepts such as integration, assimilation, and global citizenship. Second, in the postings related to their interpretation of public perception, they noted some common viewpoints within their local contexts in relation to issues raised in the novels. For example, based on *The Silent Boy*, one participant argued that "our population is still highly uneducated on the topic of mental illness." Other participants explored issues of stereotyping and the ongoing misunderstandings that exist in our schools and society. A second participant commenting on the need for respect also recognized that a novel can provide "great insight into how children think. Most adults make the mistake of assuming that children understand a situation or incident." Third, within each book discussion, participants shared their personal experiences relating to the topic or their observations based on their classroom practicum experiences. Sharing these authentic experiences added to the discourse and enhanced the social presence. Fourth, participants acknowledged the role that teachers and schools need to play in addressing issues of cultural diversity and inclusion. The language used in the postings (e.g., "we should", "we take", "our responsibility", "it is our job") indicated that the participants perceived themselves as teachers having a role in making a difference. Through the scaffolding of the discourse, they went one step further by identifying what teachers and schools should do to support all students within the formal educational experience.

Discussion

The teacher educators' intentional planning of the initial task enabled the participants to develop a sense of community as they came together and began to share information and experiences. From the nature of the postings, it appeared that the online community was a nurturing and a safe place to ask questions, share ideas and begin to develop common ideals and values related to cultural diversity and inclusive classrooms.

The teacher educators who designed and facilitated the online experience scaffolded learning initially by using the book rap to trigger conversation. At this stage, the pre-service teachers were beginning to make connections, seek information and formulate questions.

Phase Two: Exploring Cognitive Presence and Engaging in Critical Discourse

Expectations of the work

To explore the issues developed in the four novels, the teacher educators invited eight academics from both the University of Calgary and the University of Southern Queensland to participate in the online discussion. The academics served as experts in the following areas: indigenous education, English as a second language, inclusive education, disability awareness and advocacy, cultural diversity and autistic spectrum disorder. Separate asynchronous discussion forums were created for these topics and the experts were assigned a forum to facilitate based on their expertise. Pre-service teachers were asked to

join their colleagues and the experts in discussion to become more informed, ask questions and to discuss the implications for classroom practice.

Findings

Participants used this phase of the project for exploration. They were researching information to contribute to the interactions they had with experts and colleagues. Table 3 shows that the participants posted 30 messages of which 20 were a combination of stand alone postings and postings in response to what others had written. In many cases, they expressed their feelings or reaffirmed the thoughts of others. Further, 10 of the 30 messages were classified as cognitive in that the participants were seeking clarification, making inferences or proposing strategies. From this analysis, it was evident that participants gleaned information largely from the online discourse and not from external or multiple resources.

Table 3. Phase Two Frequency of Pre-service Teachers' Online Responses within Experts' Forums

	Participative	Social	Interactive	Cognitive	Metacognitive
Number of postings	30	0	20	10	0

Three themes emerged from the pre-service teacher discourse with the experts. First, their questions were grounded more in praxis rather than in theory. The following examples highlight how the pre-service teachers were looking for insights and direction based on what they could be doing to support diversity and inclusion: "Where is the balance and how do we know what our boundaries are as teacher when it comes to discussing other cultures?" "I'm wondering what you think inclusive education should look like in the classroom, and how you believe teachers should cater to special needs without isolating children with disabilities?" Second, pre-service teachers were very aware that they needed to put into practice strategies to support diversity and inclusion. In their postings, they shared experiences and raised awareness of issues. For example, they questioned who decides what is to be taught and from what perspective is indigenous issues taught? They wanted to know how to teach indigenous studies in an authentic way. It was evident in this particular discussion forum, that they were very conscious of honoring and respecting other cultures. Third, they drew upon their practicum, personal experiences and observations in responding to experts and colleagues, although limited connections were made to other comments or to research literature.

Discussion

Two critical issues are apparent in the data from this phase. First, the discourse in phases one and two did not shift along the continuum from being monologues where experiences and opinions are shared to the demonstration of higher order thinking through rich, informed discussion (e.g., embedding research literature) as part of the critical discourse and the building of shared meaning and new knowledge. Often a culture of *pathological politeness*, a term identified by Walter Archer (cited in Garrison & Anderson, 2003), exists within online dialogue where participants statements are not challenged. The teacher educators and/or experts needed to play an active role in the development of group trust and modeling of critical dialogue "which supports and encourages probing questions, skepticism and the contribution of more explanatory ideas" (Vaughan, 2004, p. 12).

Second, the pre-service teachers asked questions and acknowledged the need to address cultural diversity and inclusivity in schools. However, there was limited evidence indicating that they were developing strategies to address diversity and inclusion and limited sharing of information in terms of 'how will I do this'? The transfer from personal commitment (e.g., 'I need to do this') to professional practice (e.g., 'how might it look?') was not evident in the data. As pre-service teachers, they may not have yet had opportunities to delve deep into relevant literature and observe theory in practice within their field placements. As a result, they may have limited models or images to draw from as they develop their pedagogical practice that embraces diversity and inclusivity.

*Phase Three: From Discourse to Knowledge in Action**Expectations of the work*

A two-hour videoconference was organized for the pre-service teachers, experts and teacher educators in Calgary and Toowoomba. The purpose of the conference was for the pre-service teachers and experts to further explore pedagogical practices and classroom applications. This was taken up in two ways in the conference. First, as a large group they engaged in conversation based on the following questions: Does your pedagogy need to change to support and nurture an inclusive classroom? What might an inclusive classroom look like, sound like and feel like? Second, in small groups at the two locations, each group was given a classroom teacher scenario to consider in addressing the type of support needed to meet the learning needs of students and what would be required in terms of planning and teaching to meet these learning needs. The videoconference concluded with a brief conversation about what type of toolkit of resources, artifacts, skills and expertise do pre-service teachers need to create inclusive classrooms.

As part of the knowledge in action, pre-service teachers who attended the videoconference were asked to develop an action plan with short and long term goals for personal development in the areas of diversity and inclusion. Drawing from their experience within their respective education programs and knowledge developed from the project experience, the action plans were to focus on their teaching in their next major teaching practicum experience. Through this plan, with each objective, they were to explore how they were going to achieve it, identify a timeline and resources required, acknowledge possible barriers to be addressed, and noted how they would know if they had achieved their objective.

As the final component of the work, pre-service teachers were asked to write a reflection of their experience working as online collaborators who had inquired into issues and practices that impact teaching and learning in the twenty-first century. These reflections were shared in an online discussion forum.

Findings

Participants acknowledged in their reflections that they enjoyed and/or were supportive of the online collaborative experience. Only one pre-service teacher indicated that she “did not get immersed into the international project and was just posting things to get them done.” This individual stated that “it took a lot of time to read their responses that were posted by different students.” However, she commented that she “did enjoy the different perspectives”.

Four factors emerged from the data. First, the books used to initiate the project were well suited to the topics and for the pre-service teachers. One participant commented, “I loved reading the novel, and was really excited for what was to come.” Another pre-service teacher noted that the online collaborative experience allowed them to continue what they had learned from the novels and to “delve deeper into our topics of interest.”

Second, the participants appreciated the opportunity to connect to international colleagues and the experts in their discussions about diversity and inclusion. They were able to explore similarities and differences between the two countries in terms of how diversity and inclusion are taken up in the classroom and put into practice in education. One pre-service teacher revealed it was a valuable “experience to be able to share ideas with such a diversity of others. I really enjoyed reading everyone’s thoughts and insights especially those of the experts.” A second person commented that “very rarely are we presented the opportunity to participate across continents in a study surrounding some of the most important issues we face as teachers.”

Third, the videoconference experience provided pre-service teachers with a different means of communicating with their colleagues. One participant recommended using more videoconferencing throughout the project because it may have helped in developing deeper understandings.

Fourth, the experience of working within an international collaborative project has given participants insights into how ICT can be used and how such a project might be used within their classrooms. One participant noted that she had “learned how technology was and could be utilized and applied to facilitate discussions across several viewpoints and landscapes.” Another pre-service teacher saw how this type of online collaborative work could be transferable to higher grades in elementary/primary classrooms.

One major challenge noted by the participants in the study was time and timing. The Canadian pre-service teachers commented that the project occurred from the middle to the end of the semester which seemed to provide them with limited time given the other semester expectations. Recommendations were made in terms of starting earlier and/or running the project over two semesters.

Discussion

In their reflections, participants acknowledged the benefits of the online collaborative experience and insights gained in terms of how ICT can be used in their classrooms to connect to content and experts. The project gave them an experience to develop a deeper understanding of diversity and inclusion in education. Living and reflecting on the lived experience has given the pre-service teachers knowledge and experience to draw from in terms of integrating ICT into their future practice.

At the centre of the online collaborative framework is knowledge in action where learners test and defend solutions to problems or apply their knowledge to the real world. The pre-service teachers created action plans. However, given the online learning experience was completed at the end of the semester for the Canadian pre-service teachers, the researchers will not know if and how the pre-service teachers enacted these plans. The long term effect of the project and the action plans would require an additional study to follow these pre-service teachers through their next teaching practicum to see how they draw upon the project experience, what questions raised from the experience were used to trigger a new cycle of inquiry, and how their knowledge and experience gained through the project guided their practice.

Implications

Three key implications have been identified from the research. First, to develop and foster metacognitive awareness within pre-service teachers requires articulation and modeling. Henri (1992) defines metacognitive as having a “[s]tatement related to general knowledge and skills and showing awareness, self-control, and self-regulation of learning” (p.125). To develop metacognitive knowledge and strategies, teacher educators should discuss and show pre-service teachers indicators of dialogue that demonstrate metacognitive awareness. The following are examples of metacognitive indicators: “Asking whether one’s statement is true...Predicting the consequences of an action... ‘I’m pleased to have learned...’” (Henri, 1992, p. 132).

Hacker (1998) argued that conscious deliberation and regulation of “one’s knowledge, processes, and cognitive and affective states” (p. 11) aide in the development of content knowledge and pedagogical practice. Hartman (2001) suggested that verbalizing thinking encourages the development of metacognition. It is through the intentional planning and the modeling by teacher educators that this can be achieved and that pre-service teachers have a greater awareness of how to accomplish this with their future students through inquiry-based learning.

Second, the aim of the project was to move beyond the location of information and answering questions. Cognitive presence as evidenced by engaging in higher order thinking within online spaces requires facilitation of the discussion of personal narratives to discourse “that is conceptually rich, coherently organized and persistently exploratory” (Lipman, 1991, p. 19). Critical thinking is shaped by reflective thinking and metacognition (Garrison, 2003). Further, the role of teaching presence is crucial in the design and implementation of online collaborative work so to achieve higher order thinking demonstrated by knowledge in action.

Third, time and timing are important factors to consider in the intentional design of the work and in facilitating the discourse. Harris (1999) argued that the quantity of time allocated for an online

collaborative learning experience can be insufficient. Therefore, there needs to be time for planning, developing and implementing online collaborative learning. There needs to be adequate time for the various stakeholders to meet, develop shared philosophies, discuss viewpoints about ICT integration, clarify expectations and tasks, and develop a climate of trust to ask questions and negotiate decisions around the work. In addition, the formal structure of semesters at each educational institution (e.g., semester start times, time off-campus for field experience and holidays) impacts availability of time and hence tasks requirements for learners to complete. Further, if working with people outside of the local time zones, then consideration needs to be given to time changes and when people can meet, if synchronous communication is required.

Conclusion

Pawan, Paulus, Yalcin and Chang (2003) have recommended that “good learning is collaborative and that understanding comes through modeling, participation in, and reaction to the behaviors and thoughts of others” (p. 119). This collaborative project created a forum for pre-service teachers to experience ICT integration as a way of interacting with content and people in the exploration of diversity and inclusion. At the same time, it provided them with a model of how they can capitalize on the potential advantages of ICT and to extend learning beyond traditional classroom practices.

Pre-service teachers valued the opportunity to inquire and engage in conversation about similar issues (e.g., diversity and inclusion) within different contexts and countries. The multiple perspectives from colleagues, educators and experts influenced their personal meaning and shared understanding of issues and practice facing pre-service and in-service teachers globally.

When the goals are to engage pre-service teachers in higher order thinking and metacognitive processes through online collaborative experiences, consideration must be given to teaching presence. The intentionality of the design of the inquiry-based work and the facilitation of the online discourse requires attention to time as a key component to teaching presence before, during and after the educational experience.

Global digital classrooms provide flexible forums where pre-service teachers, teacher educators, and others (e.g., experts and in-service teachers) have opportunities to inquire into topics of mutual interest and explore possibilities in practice relevant for teaching and learning in the twenty-first century.

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