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Photographic Images as an Interactive Online Teaching Technology: Creating Online Communities

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Creating a sense of community in the online classroom is a challenge for educators who teach via the Internet. There is a growing body of literature supporting the importance of the community construct in online courses (Liu, Magjuka, Curtis, & Lee, 2007). Thus, educators are challenged to develop and implement innovative teaching technologies that help create virtual communities. The purpose of this exploratory research project was to document and analyze the students' perceptions of an original interactive teaching technology called photovoice (PV) (Wang, & Burris, 1997). PV was trialed as a teaching strategy in a graduate course on change management. Following the completion of the course, qualitative data was collected from students regarding their experiences with PV. Three key themes emerged from the data: (a) support for course engagement, (b) enhancement of the learning environment, and (c) development of social connectedness. These findings are discussed within the context of an online learning community as described by Rovai (2002a) and the Community of Inquiry Model proposed by Garrison, Anderson, and Archer (2000). Finally, research questions that arise from this study are outlined.

Implementing effective interactive teaching technologies in any learning environment is challenging. This is especially so in online instruction where some say asynchronous communications and the potential for disconnectedness may impede interaction and result in feelings of isolation (Slagter van Tryon & Bishop, 2006). Proponents of social constructivism highlight the role of social influences and community in the learning process in distributed learning (Brook & Oliver, 2003). The importance of creating community in higher education offered through distance is essential "to support collaborative learning and discourse associated with higher levels of learning" (Garrison, 2006, para 3).

Paramount to development of community in the online classroom is the instructor's ability to facilitate communications (Brook & Oliver, 2003). Traditional technology tools used to facilitate online communications include discussion forums, chat facilities, and email. While these traditional tools are effective to a degree, alone they often lack strategies that enhance feelings of social connectedness (Slagter van Tryon & Bishop, 2006). Feelings of isolation and low sense of community are factors associated with negative online learning outcomes such as low perceptions of cognitive learning (Rovai, 2002), learning engagement, and course satisfaction (Liu, Magjuka, Bonk, & Lee, 2007) as well as low persistence rates (Rovai & Wighting, 2005). Therefore, there is a need to add more innovative teaching technologies that maximize interaction and learning within the community context. Hence, this exploratory research was undertaken to test the effects of a particular interactive teaching technology in an online graduate course. This technology is called photovoice (PV) (Wang & Burris, 1997).

Photovoice was originally founded as a participatory-action research methodology where researchers used photographs to elicit, bring forth, and draw out responses from participants on issues related to their health and community needs (Wang & Burris, 1997). For the purposes of this study, the researchers modified PV to become an interactive teaching technique for online instruction. The PV teaching technology involved the use of photographic images to generate weekly discussion and involve learners actively in the online learning process. Preliminary research by Perry (2006) using PV as an interactive online teaching strategy found that positive effects related to this teaching approach were reported by learners. These included capturing students' attention, stimulating creative thinking, and creating community. Building on Perry's initial findings this study further explored the relationship between PV as an interactive online teaching strategy and creation of an online community.

This exploratory qualitative research study is presented in several sections. First, a conceptual framework of social constructivist theory is provided followed by a brief review of pertinent literature. Methodology used in the study is outlined highlighting the PV technique, data collection, data analysis, and study limitations. Findings are presented within the three emergent themes identified: (a) support for course engagement, (b) enhanced learning environment, and (c) development of a social connectedness. The discussion section examines the findings using the work of Rovai (2002a) and Garrison, Anderson, and Archer (2000).

Finally, research questions that arise from this study are outlined.

Literature Review

Conceptual Framework

The theoretical underpinning of this study is founded in social constructivist theory (SCT). Social constructivism is a dominant learning paradigm commonly linked to Vygotsky focusing on processes and interactions within a social context (Hung, 2001). Like constructivism theory, SCT 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. According to SCT, learning is characterized by mediation through language, discovery of different perspectives, and shared meaning (Hung). Given the goal of the PV teaching strategy is to "give voice" to learners in a shared learning environment, the use of SCT to inform this study is fitting.

Online learning. In an era of rapid technological change, online educational opportunities for students are growing at an exponential rate (Hodge, Bosse, Faulconer, & Fewell, 2006). The advent of internet-based telecommunications technology has increased the potential for interaction and collaborative work in online courses and thus changed the social and pedagogical perspective of distance learning (Dabbagh, 2004). Shea (2006) identified three changes to underlying assumptions associated with student-centered, interactive pedagogical models: (a) a philosophical shift from objectivism towards constructivism, (b) a theoretical shift from behaviorism towards socio-cognitive views of education, and (c) a pedagogical shift from direct instruction to the facilitation of collaborative learning. "It is argued that these foundational assumptions point to the importance of a learning community in the effectiveness of online learning environments" (Shea, 2006, abstract).

Further support for the importance of community can be identified in the literature related to student retention. Evidence of feelings of alienation and low sense of community factors have been reported in the distance education literature and may explain the relatively low, below 60%, persistence rates reported in some online programs (Rovai & Wighting, 2005). A recent study by Rovai and Wighting reported that general alienation is inversely related to classroom community and recommended that learning activities that foster a sense of community and increase academic achievement should be pursued. Deliberately creating a safe "community of learning" online is essential to online course retention and eventual success (Wiesenberg & Stacey, 2005, p. 395).

Learning community. It was believed that a strong sense of community was limited to the traditional classroom; however, in 2002, Rovai (2002a) published a paper arguing that virtual classrooms had the potential to equally build and sustain a sense of community. Rovai (2002a) 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. A sense of learner community is viewed "as consisting of four related dimensions: spirit, trust, interaction, and commonality of learning expectations and goals" (p.12).

The benefits of learning communities are many. Some evidence suggests that the creation of an online learning community serves as the foundation for a successful learning environment (Conrad, 2002; Lee, Carter-Wells, Glaeser, Ivers, & Street, 2006). In a recent study by Lee, Carter-Wells, Glaeser, Ivers, and Street (2006), graduate students "commented that community involvement made them feel more committed to attaining the shared goals of the program (93%); community membership enhanced their sense of self-worth and efficacy (80%); and engagement in the community decreased their sense of isolation and increased their social support for learning (74%)" (p.18). There is also evidence that a significant positive relationship exists between sense of community and perceived cognitive learning (Liu et al., 2007; Rovai, 2002b). These positive outcomes further support the value of learning communities in online instruction.

While the value of learning communities is evident, it is important to recognize that facilitating their formation is challenging. Given "the particular affective nature of forming and maintaining a sense of community, extra demands are placed on …facilitators" (Rovai, 2002b, p.3). In a study conducted by Lee et al. (2006), graduate students cited a community centered approach as most essential for building community followed by a constructivist learning environment. Ouzts (2006) commented, "by integrating learning activities that promote interaction, negotiation, and debate in online courses, instructors may begin to build a learning community in which students collaborate" (p. 293). Rovai (2002b) suggested "that instructors teaching at a distance may promote a sense of community by attending to seven factors: transactional distance, social presence, social equality, small group activities, group facilitation, teaching style and learning stage, and community size" (p.12). Supporting this finding, Hodge, Bosse, Faulconer, and Fewell (2006) suggested that communities of learning can be formed by mimicking proximity; this requires addressing social and psychological factors, such as social space and social presence, that impact and facilitate communications. It is apparent from this literature that development of learning communities is primarily

instructor driven. Previous research supports the importance of teacher presence in the online environment (Garrison et al., 2000).

Immediacy. Successful establishment of learning communities seems to depend on the instructor's facility to create immediacy. "Immediacy refers to communication behaviors that reduce social and psychological distance between people [and] includes both nonverbal and verbal behaviors" (Arbough, 2001, p. 43). Recent research studies (Kreijns, Kirschner, & Jochems, 2002; Na Ubon & Kimble, 2004; Richardson & Swan, 2003; Woods & Baker, 2004) make reference to the importance of immediacy behaviors in the virtual classroom but do not specifically speak of how to facilitate this experience. A recently published study by Slagter van Tryon and Bishop (2006) identified problems instructors' face that impede social connectedness online and identified 95 expert-identified e-mmediacy strategies to address these problems. Interestingly, the PV teaching technology incorporates several of the strategies identified. For example, the participants, a group of experts in e-mmediacy, identified the instructors' ability to stimulate frequent and consistent interactions throughout the course as most important to program effectiveness. The aim of PV is, at least in part, to stimulate such student – instructor interactions.

Community of inquiry. The Community of Inquiry Model (COI) developed by Garrison et al. (2000) provides a framework that encompasses concepts of community discussed in this literature review. This model highlights three major aspects on the online learning community: (a) social presence, (b) cognitive presence, and (c) teacher presence which overlap to form the educational experience of the learner. In later work, Archer, Garrison, Anderson, and Rourke conclude that "creation of adequate levels of cognition, social and teaching presence are associated with high levels of deep and meaningful learning" (as cited in Perry & Edwards, 2005, p.47). 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. Given that social, cognitive, and teacher presence are elements present in the PV teaching technology, the COI Model was used to guide the analysis and interpretation of data in this study.

Summary. The social aspect of learning and the importance of community are well documented in the literature. However, there is little research on the use of specific online teaching technologies such as PV in developing a sense of community conducive to a positive virtual learning environment. This study builds on research in that it examines the use of PV in helping to create a sense of community in the online educational environment.

Method

Photovoice Technology

As stated previously, PV was originally founded as a participatory-action research methodology where researchers used photographs to elicit, bring forth, and draw out responses from participants on issues related to their health and community needs (Wang & Burris, 1997). One of its goals is "to promote critical dialogue and knowledge about important issues through large and small group discussion of photographs" (Wang & Burris, 1997, abstract). By entrusting common people, not health specialist and policymakers, with cameras, PV allowed participants to document and discuss their life conditions as they saw them. Through this research methodology, participants, even those who were not especially verbally articulate, were enabled to effectively communicate their perceptions and insights to investigators (Wang, 1999). PV engaged community participants into a group process of critical reflection.

The researchers in the study reported here took the PV research method and transformed it into an interactive teaching technology for online instruction. The resulting PV teaching technology builds on the theoretical understandings established in the education literature on critical consciousness and feminist theory (Wang & Burris, 1997; Wang, Burris & Xiang, 1996). The PV teaching technology involved the use of a purposefully selected image to generate discussion and involve learners actively in the online learning process. Digital images, selected by the professor for their relevance to the topic of the week, were posted the first day of a new unit as part of the introductory discussion for a topic forum. Photographic images used in the course included scenes of nature or human made items that in some sense could be related to the week's unit. Images were specifically chosen given their interpretative potential. The PV for a particular unit was selected by the course instructor to attempt to elicit certain reactions, thoughts, and comments from the students. For example, in the unit on initiating change, the image used was a fence under construction. One part of the fence was old and shabby while the rebuilt part of the fence was freshly painted, straight, and attractive. This image elicited a wealth of discussion regarding the difficulty of letting go of the old to bring in the new, the challenge of adapting to the new look of change, and comments about the hard work of making change happen.

Each purposefully selected image was accompanied by a reflective question posed by the instructor. The question invited learners to react, or give voice, to the photo through a written conference posting. Students were encouraged to view the

photograph and consider the question and then to contribute to a special discussion forum provided specifically for that activity.

Data Collection

Similar to the preliminary PV research conducted by Perry (2006), this study used PV as a teaching technology and collected qualitative data related to student experiences with PV. Fifteen students in a graduate class on change management were exposed to the PV technology. This group was chosen as the primary investigator of this study instructed the course and was able to administer the PV technology. As appropriate with convenience sampling, all students in the class were potential participants in the study. Given the change management course was offered as part of a nursing and health studies graduate program, students possessed undergraduate degrees and work experience in health related fields such as nursing, social work, and health care management. Demographically, the students were primarily female, middle aged (greater than 30 years old), and resided in Canada.

As part of a 13 week course that was offered online, these learners were invited by the instructor to participate weekly in a PV forum by viewing the posted photographic and posting their reaction to the reflective question. Participation in the PV forum was voluntary and no grades were attached to participating or not. At the conclusion of the course, after all final grades for the course were finalized, a faculty member who was not associated with the course invited students to comment on their experience with PV in a designated forum. A third party compiled the comments and removed all identifiers before sharing the data with the investigator. All potential participants had consented to having their comments used for research purposes. Ethical approval for the study was granted by the Athabasca University Research Ethics Approval Board.

Data Analysis

Qualitative data was systematically analyzed using a process similar to narrative analysis as described by Priest, Roberts, & Woods (2003). Specifically, the participants' qualitative comments regarding their experiences with the PV strategy were read several times by the investigators; fragments of sentences, sentences, or groups of sentences expressing a key idea were highlighted; and then grouped together to identify core themes. Mitchell and Jones (2004) call this process "themetising." The common themes that were identified are a means of communicating what was experienced by the study participants. Submissions varied in length from a few sentences to several paragraphs.

Study Limitations

Limitations of this study relate to the small sample size, response bias, piloting the PV teaching strategy by only one instructor, and the homogeneity of the participants. Only one course with a maximum of 15 potential study participants, a small sample, was exposed to the PV teaching strategy. Students who opted to participate in this study may have been those who viewed PV positively and thus were more motivated to respond. This may have biased the results and positively skewed the findings. The course in which the strategy was used related to the theme of change management. Findings may be quite different in a course with different content. Similarly, instructors have individualized teaching styles that impact the ethos of the online learning environment differently. Thus, use of the PV strategy by another instructor may not result in similar findings. Additionally, the homogeneity of the sample, mostly female graduate students in health care leadership positions, could likely have influenced the findings. Furthermore, although the course in which the study participants were involved was completed and final grades had been submitted before data were collected, it is possible that the previously established students-researcher relationships may have influenced the tone of the responses from the learners. Finally, the subjective nature of analysis of qualitative data may be viewed as limiting. However, within the context of qualitative research, validity was achieved through the agreement of the research team that reoccurring themes were drawn from the data.

Given the preliminary nature of the research and the limitations discussed, it is not possible to generalize results. However, the aim of this qualitative study was not to generalize but to explore perceptions as they related to the PV teaching strategy. Further research using a larger sample size and rigorous quantitative and qualitative designs are necessary follow-up to this investigation as the proposed findings remain inconclusive due to the study limitations.

Results

The narrative analysis of the qualitative data indicated that the PV teaching strategy was viewed as a very positive approach in the delivery of a graduate online course. Three key themes emerged from the data: (a) support for course engagement, (b) enhancement of the learning environment, and (c) development of a social connectedness. Each emergent theme will be detailed by in-depth reporting of the data. Data within the first two emergent themes was further categorized into two sub-themes.

Support for Course Engagement

In general, students felt that PV supported engagement in the course content. Support for course engagement emerged in two sub-themes: (a) focus on the topic and (b) early and full engagement into course content.

Focus on the topic. Photovoice was identified as an effective method for the instructor to introduce a topic. One participant commented that "with PV the instructor was able to set the stage for the week's learning." Another participant noted that PV was used as "a gentle way to guide our thoughts in the direction of the topic for the week."

It appears that PV assisted students in identifying learning expectations while helping them to focus on a particular course topic. One respondent wrote,

> What the PV would do for me each week is help me gently refocus on the week's course work. It was like drinking a nice warm cup of java. [PV was] kind of like opening my eyes to the possibilities of the week.

Early and full engagement in course content. It was noted by the respondents that the PV activity provided students with a way to engage early and more fully in course content. One student suggested that PV "provoked early meaningful discussion each week and the majority of the class participated in the discussion." Another student felt that the PV was like "a quick 'ice breaker' to get the week's discussions started early."

It was reported by the participants that PV provided a safe and fun environment to explore the focus topic. One student commented "what a great way to start discussion…no right or wrong answers...just your perceptions." As there was no right or wrong interpretation of the photograph, students seemed to feel safe expressing their views. PV helped create a non-intimidating learning environment. The outcome was that many students reported the exercise was "fun" and that they looked forward to it every week. One participant commented on the excitement generated by the surprise element of PV, saying,

> Then there was the "mystery" aspect. What would [the instructor] come up with this week? I always waited with great anticipation to see what would be unveiled from behind that sturdy, electronic paper clip!

Another participant commented on the anticipation generated by the upcoming PV, saying, "Each week I looked forward to what picture may grace our screens."

Overall, PV was viewed by the study participants as a "gift" that provided focus and encouraged early and full course engagement. As one student noted "PV very much brings in the concept of the 'invitational classroom'."

Enhance Learning Environment

The second major theme relates to enhancement of the learning environment. Findings suggest that PV enhanced the atmosphere and tone of the electronic classroom thus stimulating interest and creativeness.

Interest. The rich discussions generated by the PV activity along with the visual stimulation the PV images provided appear to have prompted class interest. One student reported that "The PV activity keeps the topic open ended and diverse rather than narrow in one direction." Others described the tool as adding color to an otherwise gray and dull medium [of online learning]. Two students reported being visual learners and felt that the visual stimulation of the photographs facilitated learning and retention for them. One visual learner said,

> Pictures assist with memory through the combination of two channels - words and pictures. So the photovoice, linked with the week's narrative material, has the potential to enhance learning and retention. Certainly it worked that way for me.

Another study participant who noted she had a visual learning style said,

> I'm a visual learner and I believe in that old saying "a picture paints a thousand words." The photovoice helped begin to create the flow of words I would need each week to better understand the week's key learnings, and to be able to contribute to the forums.

Creativeness. Many students reported that the PV learning tool facilitated creative thinking. Many commented that PV caused them to "think outside the box." One respondent noted, "It is a great way to stimulate creativity and encourage us to think beyond the usual."

Class creativity was viewed as having a positive influence on the quality of the discussion. Some students felt it contributed to valuable dialogue. One respondent said,

> It helped me to review the course material with both sides of my brain - the creative and the analytical. With the combined juices flowing, I think the responses to the rest of the questions and dialogue was richer, less rote, and more creative.

Another student said something parallel by commenting,

> For me PV was similar to the idea of how an intriguing piece of artwork can generate reflective and stimulating discussion. Photovoice further enabled the creative juices in the brain to get flowing – it challenged me to think beyond facts and textual materials.

These student comments suggest that the inclusion of PV enhanced the learning environment by stimulating interest and creativeness. It appears that PV moved the learning tasks beyond the regular reading and writing activities of most online courses. The PV activity appears to have enhanced the learning environment for the students by capturing their attention and inspiring creativeness.

Development of a Social Connectedness

It seems that PV contributed to the development of a sense of social connectedness in the virtual classroom. One student felt that PV "let us see into the inner self of each other." Social connectedness may have occurred because the sharing nature of the discussion that PV elicited. In other words, when students responded in narrative to the photographic images they revealed some elements of themselves to the class. Their perceptions of the photographs exposed their personal values, beliefs, hobbies, life circumstances, and priorities and allowed the class participants to get to know one another on a more intimate level. This is reflected in the following student comment:

> Sometimes online learning can be isolating, and just doing the readings and learning activities is not enough for that enjoyable social interaction that can be found in a [real] classroom. Photovoice provided that [social interaction element] to my learning environment as I got to know my classmates – I mean really know them because of how they saw the photos.

Posting of PV interpretations encouraged students to share their own perceptions and consider the perceptions of others. This added a personal dimension to the electronic instructional medium. As one student reported,

> Photovoice presented variety in a faceless virtual world. I found reading the responses of other people allowed me a moment to glance into their world demonstrating a personal view which may not have come through in their [other] postings.

Another student described her experience with PV as a way to connect with others this way:

> The array of responses, interpretations - sort of like a book -somewhat biographical as we all identified with the picture in different ways. It provided a forum for us to get to know each other through different lenses.

Through these quotes, it is evident that discussion prompted personal responses to the photographic images which contributed to a sense of social connectedness in the learning environment. By participating in PV, students were able to interact with their classmates in a manner that facilitated meaningful personalized discussion. As one student described this theme, PV "served to knit the class of learners together in a much different way."

Discussion

As demonstrated in the findings section of this paper, from the students' perspective, the PV teaching strategy supported course engagement by focusing the topic and encouraging early and full engagement in the topic for the week; enhanced the learning environment by prompting student interest in the topic and inspiring creativeness; and helped developed a sense of social connectedness in the online classroom. These key findings are discussed in the context of two questions: "Did PV contribute to the development of a sense of community for the students who participated in this study?" and "Does PV possess elements needed to create a learning community?" The work of Rovai (2002a) provides the foundation to explore the first question, while the work of Garrison et al. (2000) informs the second question.

Sense of Community

Rovai (2002a) concluded that a sense of community could be built in the online environment. Using his definition, an online classroom community is comprised of four distinct dimensions: (a) spirit, (b) trust, (c) interaction, and (d) common learning expectations. Threaded throughout the three emerging themes are elements of these dimensions.

Spirit. According to Rovai (2002a), "the first dimension, 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" (p. 3). Many students in this study reported that they enjoyed the PV activity and were eager to participate each week. It is reasonable to postulate that this eagerness to participate increased the time students spent together and promoted bonding. It is likely that, through early engagement,

PV promoted interaction and created community spirit.

It should be noted that not only did students in the course make an initial posting about a PV image; they would often respond to their classmates postings about the same image. It was in these exchanges that students got acquainted with one another and spent virtual time together. By supporting early and full course engagement perhaps PV was a vehicle for helping to create online community classroom spirit.

Trust. The second dimension of the online classroom community is trust, which according to Rovai is nurtured by a feeling of safeness (2002a). Trust is needed to "engender the open and caring environment needed to promote diverse and constructive interactions that empower learners to negotiate common understandings in their quest for learning new perspectives and ideas" (p. 5). Students in this study felt that the PV activity provided a safe learning environment that was not viewed as intimidating. Not only did this perceived safeness encourage full course engagement, but it allowed for candor in sharing perceptions. As one student noted, there were no "right or wrong answers… just your perceptions" in the PV activity. It is likely that the safe environment created by the PV teaching technology contributed to feelings of trust by encouraging personalized discussion and social connectedness. Also, since the PV activity was the first activity in each unit it helped to systematically create that non-intimidating tone each week so that by the end of the course the students were very comfortable in their virtual classroom.

Interaction. In discussing the third dimension, interaction, Rovai (2002a) noted that "learner interaction is an essential element of, but not the full solution to, the development of a sense of community" (p. 5). According to Rovai (2002a), interaction as related to sense of community may be task-driven or socio-emotional in origin. "Task-driven interaction is under the direct control of the instructor and often takes the form of responses to instructor-generated discussion topics" (Rovai, 2002a, p. 5). Fittingly, the PV activity was an instructor driven activity that encouraged participation in an instructor-generated discussion. Through visual stimulation the instructor, using PV, was able to enhance the learning environment by creating interest and inspiring creativeness that promoted rich discussion and interaction both between students and between the students and the instructor.

The socio-emotional element of PV should also be noted. The images selected as PV images were chosen in part for their potential emotional impact as well as for their relationship to the topic of the week. For example, the photo used for the unit on resistance to change was an image of an autumn nature scene in which it seemed that the world was resisting the decline into winter. The colors and image of struggle evident in the photo evoked an emotional response in the class which students identified with. The emotional trigger of the image resulted in shared discussions and multiple interactions around this common experience of "resistance" both in relation to the class content (organizational change) and in a personal sense as well.

Common learning expectations. The final dimension of the classroom community, common learning expectations, "reflects the commitment to a common educational purpose and epitomizes learner attitudes concerning the quality of learning" (Rovai, 2002a, p. 6). Rovai stresses that learning which occurs within the context of social interaction and work represents the common purpose of the community: shared values, goals, and satisfaction. Through purposeful interaction, PV, as a learning activity, supported situated learning. From the data, it appears that students felt that PV provided a social dimension to the online classroom that is not always present in online learning. Photovoice, as one student described it, "served to knit the class of learners together in a much different way." Through the development of social connectedness, it appears that the PV activity assisted students in coming together and realizing a common purpose that supported common learning expectations.

Photovoice and a sense of community. Through participation in the PV activity, it appears that students did experience elements of the four dimensions of community as defined by Rovai (2002a). Analysis of the findings suggests that spirit, trust, interaction, and common learning expectations were identified in relation to the PV teaching technology, thus suggesting that PV did contribute to a sense of online community for the students who participated in this study.

Community of Inquiry Model

Using the COI model (Garrison et al., 2000), the key findings of this study are discussed more fully in terms of online community development. Each element of the model will be examined in association with the findings beginning with cognitive presence.

Cognitive presence. The element of cognitive presence is most basic to success in higher learning as it requires students to "construct meaning through sustained communication" (Garrison et al., 2000, p.4). Cognitive presence is established through a cycle of practical inquiry where participants move deliberately from a triggering event through to exploration, integration, and application (Garrison, 2006). PV, through the provision of a visual aid, created interest and inspired creativeness. This appears to have acted as a triggering event to provide a foundation for sustained discussion. The safe environment provided by the PV

activity allowed for the expression and exchange of personal interpretations and views. PV also allowed for resolution or application. As one student described, "PV helped begin to create the flow of words I would need each week to better understand the week's key learnings, and to be able to contribute to the forums." PV appears to have acted as a scaffolding strategy to facilitate further knowledge acquisition about a topic.

Social presence. "Social presence is defined as the ability of participants in the Community of Inquiry to project their personal characteristics into the community, thereby presenting themselves to the other participants as 'real people'" (Garrison et al., 2000, p. 4). The three main aspects of social presence are affective communications, open communications, and group cohesion (Garrison, 2006).

The social presence element of the COI model was facilitated by PV. PV related discussion allowed participants to introduce their personal characteristics to their classmates. This is evident in the students' use of descriptors such as "allowed you a moment to glance into their world demonstrating a personal view" and "the array of responses, interpretations… [were] somewhat biographical" when describing PV. Student respondents in the study noted that PV permitted them to socially connect by getting to know their classmates through sharing ideas and meaningful discussion.

To further demonstrate the social nature of the PV teaching technology, the presence of the three categories of social presence from the COI model can be identified. First, throughout the PV postings, affective expressions and rich dialogue resulted. Second, PV promoted open communications. It was recognized by study participants that PV provided a "safe" and "non- intimidating" learning environment where expression was risk free. Third, group cohesion was achieved as the PV activity encouraged social connectedness between classmates. Through sharing of thoughts and personal perceptions, the students' fostered relationships that encouraged learners to see the instructor and other participants as "real people."

Teacher presence. Teaching presence in the COI model is comprised of two general functions which are likely to be the primary responsibility of the instructor. These two functions are course design and organization, and facilitation (Garrison et al., 2000). Students reportedly perceived PV as a method used by the instructor to introduce the weekly course topic and focus early discussion on course content. Through PV, the instructor was able to facilitate the students' ability to identify the learning expectations weekly. The PV activity was predictably the first assignment each week during the course. It also helped to establish the teacher presence in terms of course organization. Study participants commented that they could depend on there being a PV activity first thing Monday morning and they valued this predictability and organization. They would "know" their instructor have been into the course because a new photo was posted with a thought-evoking question. The instructor's ongoing involvement in the course was made evident by the appearance of a new PV weekly.

Photovoice and community of inquiry. The analysis of the PV teaching strategy using the COI Model suggests that PV possesses the elements needed to help create a learning community. Through PV, the students' perceptions suggest that they may have been stimulated cognitively, linked with other classmates socially, and experienced the ongoing presence and leadership of their instructor.

Conclusion

Given the abundance of literature supporting the importance of the community construct in online teaching and learning, educators are challenged to develop and implement innovative and effective teaching strategies that create communities and maximize learning within the community context. From this study, it is evident that the PV teaching technology may potentially be a valuable teaching tool in helping to achieve this end. Many of the students' comments reflected ways in which PV contributed to a sense of community and addressed the key elements of social, cognitive, and teacher presence. The findings suggest that PV may be valuable in helping to create learning communities. However, due to the limitations of this study, no definitive conclusions can be drawn.

While the findings of this study provide a good starting point for strategy specific investigations, there still remains many unanswered questions. For example, is there a relationship between PV and teacher style? How does learning style influence the student's experience with PV? Is the potential value of PV related to the nature of the course content? Are some topics/courses more suitable to the PV teaching technology? These questions provide much fuel for ongoing research in this area.

To support the development of community in the online environment, instructors are challenged to develop and employ unique approaches such as the PV strategy. This research provides a starting point for further studies on PV as an innovative online instructional tool to facilitate the creation of community in distance education classrooms.

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