Using the Artistic Pedagogical Technology of Photovoice to Promote Interaction in the Online Post-Secondary Classroom: The Students' Perspective

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Abstract: This study explores the effect of the artistic pedagogical technology (APT) called photovoice (PV) on interaction in the online post-secondary classroom. More specifically, this paper focuses on students' perspectives regarding the effect of PV on student to student and student to instructor interactions in online courses. Artistic pedagogical technologies are teaching strategies based on the arts (Perry & Edwards. 2010). APTs use music, poetry, drama, photography, crafts or other visual media as the basis of teaching activities. Photovoice is the purposeful use of selected visual images and affiliated refection questions as an online teaching strategy. Social Development Theory (Vygotsky, 1978) and Janzen's Quantum Perspective of Learning (Janzen, Perry & Edwards, 2011) provide the theoretical basis of the study. The convenience sample included 15 graduate students from the Faculty of Health Disciplines at an online university. Participants completed a 4 month master's course in which PV was used. Data were collected after final course grades were official. Data were gathered using an online questionnaire based on an adaptation (with permission) of Rovai's (2002) Classroom Cohesion Scale (CSS) and Richardson and Swan's (2003) Social Presence Scale (SPS). A follow-up focus group with 6 of the original 15 participants was held. Quantitative and qualitative data were collected. This paper focuses on findings from the quantitative data with supportive qualitative comments. Data analysis of the quantitative data takes the form of descriptive statistics. Data analysis of the qualitative data used NVivo software. In sum, the majority of respondents did find that PV had a positive influence on course interactions, but also on their sense of community, comfort in the educational milieu, and on how well they got to know themselves, other learners, and the instructor. Questions for further research are posed.

Keywords: online education, eLearning, artistic pedagogical technologies, photovoice, social development theory, quantum perspective of learning

1. Introduction

This purpose of this study was to explore graduate students' perspectives regarding the effects of the artistic pedagogical technology (APT) called photovoice (PV) on interactions in online post-secondary classrooms. Of particular interest was the viewpoint of learners regarding if, and how, PV influenced interaction among students, and between students and instructors, in an online course they had recently completed. Artistic pedagogical technologies are teaching strategies that draw from the arts (Perry & Edwards, 2010). APTs use music, poetry, drama, photography, crafts or other visual media as the foundation for student activities. Photovoice, an example of an APT, is the purposeful use of selected visual images and affiliated reflection questions as an online teaching strategy.

This paper includes a review of literature regarding interaction in online courses, focused on both why interaction is considered important and how it can be facilitated by instructors. What is known about why art-based teaching strategies facilitate interaction and build community is discussed. Vygotsky's (1978) Social Development Theory (SDT) and Janzen's Quantum Perspective of Learning (Janzen et al., 2011) are described. The study methods are articulated and findings presented. Further, the findings are explored in the context of the theoretical foundations of this paper. Succinctly, the majority of respondents did find that PV had a positive influence on interactions, but also on their sense of community, their sense of comfort in the educational milieu, and on how well they got to know themselves, other learners, and the instructor.

2. Literature review

Interaction among participants in an online course is important to create optimal educational experiences. Online teaching approaches that treat students as "isolated learners passively receiving the theories, concepts and ideas" are not effective (Green, Edwards, Wolodko, Stewart, Brooks, & Littledyke, 2010, p. 258). To be successful, online teachers need to use strategies that promote

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interaction among participants, creating quality learning environments through the development of virtual learning communities (Vitale, 2010; Darrington, 2008). These social interactions form a pivotal base for effective learning processes (Green et al., 2010). For example, Hessler and Humphreys (2008) demonstrated that active and collaborative online course interactions led to more student effort and satisfaction with the learning experience (2008). Levine (2005) states, that interaction involves communication which is motivating to participants thus enhancing learning. Holmberg (2007) emphasized that development of personal relationships, which evolve from interaction, promotes student motivation and achievement of learning outcomes.

Interactions in online courses include interaction among students, and between students and the instructor. Garrison and Anderson (2003) noted that interaction between the instructor and student in particular enhances the effectiveness of the online learning environment and leads to higher student performance and satisfaction. Appana (2008) and Gallien and Oomen-Early (2008) echo this finding and add that meaningful student-teacher interactions in online courses also improves student grades. Richardson and Swan (2003) found that students' perceived learning, satisfaction with instructors, and perceptions of social presence were all highly correlated. Brooks-Young (2010) explains this, at least in part, by saying that "well-designed online courses support frequent one-to-one interactions between students and teachers', promoting learning that is student-centered" (p. 10).

Not all online interaction whether student-student, or student-teacher, is of equal quality. Green et al. (2010) point out that a more authentic from of interaction results in more meaningful learning. To these researchers authentic interaction involves learners feeling "purposefully engaged" in the online learning environment because they choose to be rather than because they have been directed to participate (p. 258). In other words to be effective, interaction needs to be encouraged and facilitated rather than dictated by the teacher to be authentic.

2.1 How to heighten effective interaction

Researchers agree that the teacher is responsible (at least initially) for creating opportunities for interaction and communication among classmates and between students and the instructor (Vitale, 2010; Green, et al., 2010). What teaching strategies are effective for engaging students and enhancing interaction in the online class? Vitale (2010) suggests, that "Well-planned and defined discussion questions help students to understand the course content, especially the application of new knowledge to clinical practice situations" (p. 550). Vitale emphasizes that clear course engagement strategies are foundational to building an online learning community. Evans and Campion (2007) support careful instructional planning to create a learning environment where interaction and community building occur. Young (2006) suggests quality online courses provide meaningful examples, have learning activities that students find motivating, and are taught by instructors who are enthusiastically engaged in promoting interaction and student learning.

In other words, online educators intentionally create opportunities in course design and though instruction that facilitate the desired outcomes of meaningful interaction and a learning environment where individuals share knowledge and support one another in knowledge construction (Green, et al., 2010). Hong and Sullivan (2009) urged us to rethink the design of instructional activities, supporting the effectiveness of teaching activities that are more emergent, self-organising, and less pre-defined. Jones, Warren, and Robertson, (2009) point to rapport as one of the most important features of human interaction and community building that has implications for teachers who seek to enhance interaction in online courses. Tickle-Degnen and Roseenthal (1990) define rapport as the experience of being in sync with the other person. Hutchins (2003) singled out rapport between participants in online courses as important to effective educational environments and Izard (1990) emphasized the dynamic nature of rapport as it usually develops over time in relationships.

Mak and Yeung (1999) showed that rapport is as important in online communities as in face-to-face situations. Rapport is established and developed in online educational classes when individuals become acquainted and engage in personal inquiry (Jones, 2001) and participate in "well-wishing and social support" (Yungbluth & Bellino, 1996, p. 12). In a sense, rapport is developed through social interaction, and interaction furthers the development of rapport. Further, rapport is helpful in establishing effective learning communities. A cycle is established when online courses are well designed and taught effectively.

2.2 The role of arts in facilitation of interaction and community

Using the arts as part of teaching strategies in not new. Educators have used music, painting, dance, and literature to enhance learning in various courses from math to science (Holmes 2002; Eccles & Elster, 2005; Clarke & Widdicombe, 2002). These investigators stress that the arts as an educational tool facilitates students making an emotional connection to course content, caters to a variety of learning styles, and increases student achievement (Holmes, 2002; Eccles & Elster, 2005). A study at Queens University involving 6,700 students found arts-infused teaching methods had a significant effect on academic achievement in math with students scoring 11 percentile points higher (Upitis & Smithrim, 2005). Further Upitis, Smithrim, and Le Clair, (2001) showed that students not only perform better academically, they and the teachers were more energized and engaged, when arts-based teaching strategies were part of course design.

Perhaps positive effects of art-infused teaching strategies can be explained by their effect on rapport, interaction, and community building. Art moves individuals to take a wider view, looking at multiple facets and dimensions of concepts. Learners move away from breaking knowledge into discrete elements, perhaps resulting in more analytical assessment and thinking. This broader view also prevents learners from looking at learning as a checklist or assembly-line of tasks. In thinking broadly, deeply and holistically learners are stimulated to think creatively, critically, and analytically about course content. Learners may be triggered to interact with others, sharing insights and comparing analyses. Connectedness, interrelatedness, and integration may be outcomes when arts are the foundation of teaching strategies. These outcomes have potential to promote interaction, build rapport, and help development of a sense of community (Eccles & Elster, 2005). As Clarke and Widdicombe (2002) conclude, the arts as a component of teaching strategies engages students totally, “not just with pen and pencil, but also with imagination” (p. 45).

2.3 Artistic pedagogical technologies (APTs)

APTs are a category of teaching strategies founded in the arts (Perry & Edwards, 2010). The commonality of APTs is that they all use some element of drama, music, visual art, or the literary help students learn. APTs are optional, non-graded, learning activities used in online courses. There are many APTs. For example APTs related to drama include online role-playing and movie analysis. APTs that emphasize music can involve a course theme song, while teaching strategies that focus on the literary include story-telling, story-writing, and parallel poetry. Photovoice is an APT that uses visual images. Photovoice was originally a participatory action research method employed by Wang (1999) and Wang and Burris (1997). Perry and Edwards adapted it to become an APT and used it in online graduate courses (2006; 2010). PV uses visual art in the form of specifically chosen digital images. Each image, chosen by the instructor, corresponds with a course theme. An image is combined with a reflective question and shared with online learners. Learners view the image and post their responses to the question in an online discussion forum. An example of a PV activity used in a course on leadership is an image of a band conductor leading a large ensemble. (See figure 1) The reflective question reads, “What leadership style would be most appropriate in this situation?” The student responses to the image exhibit their knowledge of leadership literature related to contingency theory but their responses are also rich with clues about their values, biases, personal history, and priorities in relation to leadership and followership.

2.4 Social development theory

The first conceptual basis for this paper comes from Vygotsky’s Social Development Theory (SDT) which is a foundation of constructivism (1978). SDT arose from Vygotsky’s psychological and educational theories in the early 20th century but initially did not gain acceptance in Vygotsky’s native Russia due to ideological repression (Davydov & Kerr, 1995). Gorbachev’s perestroika (reorganization), where “democratic, social, economical and political [reformation also] demanded” educational reform, paved the way for Vygotsky’s work to have greater influence (p.12). Through a group of Soviet scholars who adopted and further developed his theories in the early 1970’s, SDT along with its constructivist underpinnings, became and remains currently embraced as “the leading metaphor of human learning” (Lui & Matthews, 2005, p. 386).

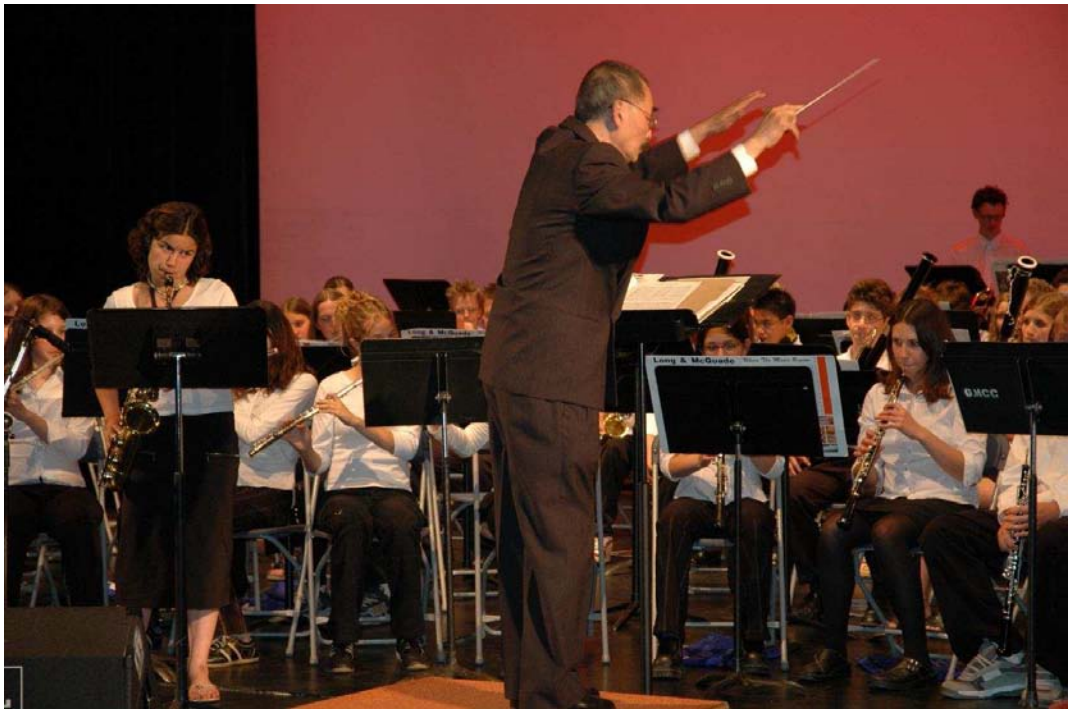

Figure 1: Example of a Photovoice image

Vygotsky, proposes five basic tenets which shape SDT: (1) the purpose of education is to develop the personalities of human learners, (2) the "creation of the conditions for discovering and making manifest the creative potentials of students" is a paramount focus of pedagogy, (3) students progressively "master a variety of inner values" through pedagogy and "personal activity," (4) authentic pedagogy espouses guidance and direction rather than force or dictation, and (5) pedagogical methods which are most effective focus on individuals rather than on student collectives (Davydov & Kerr, 1995, p. 13).

In SDT, social interaction and meaningful relationships are linked to learning (Kim & Baylor, 2006). Full cognitive development requires social interaction. In the words of Vygotsky (1987), "every function in the cultural development of the [learner] appears on the stage twice, on two planes. First, on the social plane, and then on the psychological; first between people, and then inside the [learner]" (p. 145). Thus the collective activity of the learners, through interaction and collaboration, becomes internalized in individual learners (Davydov & Kerr, 1995). Through this interaction new "potential" is acquired for relationships which further influence the social and cultural connections which are made by individual learners (Vygotsky, 1987, p. 191).

Succinctly, Vygotsky (1978) focused on the connections between people and the sociocultural context in which they act and interact in shared experiences (Crawford, 2001). Social interaction is a critical component of situated learning in which learners become involved in a "community of practice" which embodies certain beliefs and behaviours to be acquired. Through meaningful social interactions learners become fully engaged in the culture and function of the learning community.

2.5 Quantum perspective of learning

The second conceptual basis for this paper comes from Janzen's Quantum Perspective of Learning (QL)(Janzen et al., 2011). Recognizing that contemporary learning theories which have evolved since Skinner's (1954) behavioralism all have axioms, Janzen developed QL in partial response to Dewey's 1876-1877 essays which call for a bridging perspective (Eastman, 1976), and in an attempt to explain why arts-based teaching strategies such as APTs (Perry & Edwards, 2010) are effective. QL takes the more salient features of various learning theories and builds upon them in an effort to better explain learning in a technological age (Janzen et al., 2011).

While current popular learning theories such as Siemen's (2006) connectivism suggests that learning is the process of making connections, QL proposes that everything that exists is already connected. Learning becomes the process of discovering those connections. Providing students with the means

and opportunities to discover those connections becomes the task of educational institutions and instructors (Janzen et al., 2011).

QL employs exchange theory and utilizes selected principles from quantum mechanics or quantum holism in physics (Bohm, 1971, 1973) and applies the principles to learning (Janzen et al., 2011). QL posits that learning and learning processes mimic the behaviours of electrons in quantum holism. Four of the similarities between QL and quantum holism are waves and particles, superposition, entanglement (Pribram, 2006), and quantum memory channels (Krestchmann & Werner, 2005). Distilling these principles, QL accepts that everything is connected, entangled and in constant communication from the largest of structures in the cosmos to the smallest of structures in sub-atomism. This communication, connection and entanglement include the processes of learning in the temporal world.

QL suggests that learning is multidimensional, occurs in multiple planes simultaneously, and is holistic/holographic in nature (Janzen et al., 2011). Further, the potential to learn is infinite. Learning is believed to be best achieved in quantum learning environments where students, instructors, technologies, and environments are integrated in a posture of holism.

Quantum learning environments are living systems (Janzen et al., 2011). These environments grow, transform and adapt with input and output from each of the core components of that environment (student, instructor, technology and environment). In QL, interaction is a key component of the total quantum learning environment. Interaction, as it is invited and celebrated from a multitude of sources, becomes a hallmark of QL.

3. Study methods

The authors completed a large study of the effect of the APTs on graduate students and instructors from a Canadian online university. The purpose of the research was to increase our understanding of how APTs influence the online post-secondary classroom. Ethical approval for the study was granted by the Research Ethics Board of the host university. This research report focuses specifically on selected data related to the student perspective. The instructors' perspective is reported elsewhere.

3.1 Sample

Study participants included a convenience sample of 15 students who had just finished an online graduate course that used APTs (including PV) as teaching strategies. Two of the study courses were called Teaching Health Professionals and the third course named Organizational Theory. Three different instructors each taught one of these courses. All instructors were doctorally prepared, experienced online educators, and aware that they were involved in a research project. The students in the study courses were not aware that they were taking a course that was part of a research project until after grades were finalized.

All students who completed one of the three courses involved were contacted via email by the research assistant (RA) at term end. The email from the RA invited them to contact her via email if they were interested in participating in the study. Potential participants were given clear indication in the invitation email regarding what would be asked of them in terms of participation. The RA obtained informed consent from 15 from a total of 64 potential participants. One study participant had only completed one online course (the study course) and 14 participants had completed two or more online courses including the study course. Participants were from various Canadian provinces. All participants were completing a master's degree in nursing, health studies, or a nurse practitioner program.

3.2 Data collection

All student participants completed an online questionnaire that assessed their perspectives regarding the effect of PV on the educational environment in the online post-secondary class they had just completed. The questionnaire, using a 5 point Likert scale, was adapted (with permission) from Rovai's (2002) Classroom Cohesion Scale (CSS) and Richardson and Swan's (2003) Social Presence Scale (SPS). The questionnaire was prepared using SurveyMonkey and collected qualitative and quantitative data. Completed questionnaires were sent electronically to the RA. Submissions were coded by the RA and all identifiers were removed.

Questionnaire respondents were asked if they would be willing to participate in a follow-up focus group. The purpose of the focus groups (moderated by the RA and held via teleconference) was to provide data to illuminate the questionnaire responses. The moderator initiated the discussion by posing general questions, and composed probes to gather data. Six of the original 15 respondents participated in the two focus groups. The focus groups each lasted approximately 45 minutes and the RA made written notes regarding key statements during and immediately after each focus group meeting.

While the quantitative data from this questionnaire are the primary focus of this paper, quotations from the open-ended question on the questionnaire and from the focus group analysis are integrated into the findings section to provide additional insight.

3.3 Data analysis

Data analysis included descriptive statistical analysis of the quantitative data from the questionnaire. Additionally, the qualitative data from the focus group notes and questionnaire were analyzed using NVivo software.

3.4 Study limitations

The sample size was small. The findings are not intended to be generalized.

4. Findings

The majority (12/15) of the respondents had completed the course called Teaching Health Professionals. The remainder of the study participants were students in the Organizational Theory course. All participants were taking all of their courses in their master's program online. Most of the participants (93.3%) had taken two or more online courses including the study course. The study course was the first course for one participant.

In response to the question that asked if PV had a positive influence on their learning in the course, 16.7% marked strongly agree, 41.7% agreed, and the remainder of respondents (41.7%) neither agreed nor disagreed. The majority of the participants (58.4%) did find that PV had a positive influence on their learning. Participants remarked that seeing how the "individual perspectives varied" provided them an opportunity to see "something different and [from a] different angle" which enhanced their learning.

When asked if online education is an excellent medium for social interaction as demonstrated by PV, (33.3%) were neutral. The majority (67.7%) were positive. Specifically, 6/15 students agreed and 2/15 students strongly agreed that PV demonstrated online education was an excellent medium for social interaction. PV was seen by participants to "allow for more personal interaction than in the other discussion forums" and they commented that PV provides "social interaction that perhaps wouldn't be there at all without the PV tool."

Students were asked if PV enabled them to form a sense of community online. Again the majority of respondents (50%) were neutral, but this time 1/15 students (8.3%) disagreed indicating that PV was not helpful in the formation of an online community. On the positive side, 33.3% agreed with the statement and 8.3% strongly agreed for a total of 5/15 students who did find that PV helped with community formation in their online course. PV was found by one participant to create a "voluntary" and "warm sense of community." Further, according to students this sense of community "provided an outlet to get to know people and their perceptions." One participant said PV facilitated the experience of "online presence" of classmates. PV was seen as a way to "get to know someone without the…scholarly talk."

A more general question that asked if students in online courses which have learning activities encouraging interaction are more likely to form a sense of community netted no neutral responses. A large majority (91.7%) agreed or strongly agreed with this statement. Only 1 student disagreed. One participant commented that "it was a better experience than in some in-person classes," while another stated that the "informal...sense of community...came from a more personal place."

When asked if they felt comfortable interacting with other participants in PV, again a large majority (75.0%) agreed. A further 16.7% strongly agreed that they felt comfortable for a total of 91.7% on the

positive side. One participant was neutral and no respondents disagreed or strongly disagreed with this statement. One participant noted that in PV activities, “You do feel like you are having sort of an informal chat.” The words “informal” and “chat” connote comfort.

The statement that read, “My point of view was acknowledged by other participants during PV,” again elicited a strong positive response with a total of 75% (9/15) indicating that this occurred. More specifically, 1/15 strongly agreed and 8/15 agreed that their point of view was acknowledged by others during PV learning activities. The remainder of respondents 3/15 were neutral on this point with no students marking a negative response. One participant felt that acknowledgement was both implicit and explicit saying, “I did feel that my POV [point of view] was acknowledged in that course.... Maybe it wasn’t so much a formal recognition, as much as just the fact that people shared their own responses.... Sometimes it was just about the sharing without needing the responses.”

Participants were asked if they came to know themselves, other students, and the instructor through PV. Several participants (5/15) were neutral while 5/15 agreed that they did get to know others through PV. Further 2/15 (16.7%) strongly agreed that PV helped them get to know course participants. There were no negative responses. It seemed getting to know the instructor better was especially valued by participants as they were able to make “connections” with the instructor and engage in “communication... in a meaningful way.” Instructors were felt to become more “authentic” and “real” to learners because of PV. Students commented, “it was just like [we] were with a class in a classroom setting.” Respondents noted that through PV triggered interactions they began to “see the more informal side of the other participants and... [get] to know them more as people.”

The tenth question asked students if they were able to form distinct individual impressions of some course participants by their PV comments. No respondents marked disagree or strongly disagree. Approximately twenty seven percent (4/15) of participants were neutral on this point, and the remainder (66.7%) either marked agree or strongly agree indicating that they were able to form distinct impressions regarding people in the course through their PV responses. As one student said, PV provided “a nice outlet to get to know people and their perceptions of different things.” Students contended that they “got to see more of the person as opposed to another scholar.”

The last question asked if the respondent felt the learning in the course was positively influenced by PV. One person marked disagree indicating that PV did not have a positive influence on learning. Six of 15 respondents marked neutral while 41.6% gave a positive response. Of the positive responders 4/15 agreed and 1/15 strongly agreed that PV positively influenced their learning in the course. One participant wrote that PV created “an ‘aha’ moment” for her and that this laid a foundation for her to “interact” in a meaningful way with others in the course. Participants predominantly saw PV as an “opportunity” which allowed them to “integrate and apply course content more effectively.”

5. Discussion

As noted earlier, Social Development Theory (SDT) upholds social interaction as the primary route to cognitive development (Vygotsky, 1978). Further, social immersion and collaboration become the vehicles for meaningful relationships and learning (Kim & Baylor, 2006). Vygotsky’s STD proposes that individuals “do not adapt to their world, but collectively transform it and through this transformation, also change themselves” (Vianna & Stetsenko, 2006, p. 85).

PV used in these courses seemed to have a positive effect on social interaction with a majority of respondents indicating that they found it an excellent medium for achieving this purpose. When learners were asked directly about this possible effect of PV on their online course most agreed or strongly agreed that it did positively influence social interaction. Additionally in the focus group data, interaction emerged as a key concept.

The findings may offer insight regarding how interaction is facilitated by PV. A question was asked regarding the students’ perceptions of a link between interaction and community formation in online courses and the largest majority agreed that this link exists. When questioned further, 41.6% attributed PV with helping enhance community. Perhaps PV does assist learners (at least some learners) in interacting in a meaningful way with the result being the possibility of community formation.

For Vygotsky, social interaction consists of many processes including cooperation, collaboration, problem solving, conflict management, and communication (Vianna & Stetsenko, 2006). Further, social interaction is felt to come full circle as "learners jointly engage in activity, discourse, and reflection" (Yilmaz, 2008, p. 169). Through these processes learners "collectively transform" their online milieu and their individual and collective social worlds (Vianna & Stetsenko, 2006, p. 85). In PV learning activities, these processes could be reflective of the formation of community. PV discussion forums potentially act as microcosms for that community development. This construct is supported by Vygotsky's SDT where the "classroom" acts as a "microsociety" (Yilmaz, 2008, p. 169).

This transformation and development of community, achieved by social interaction (Vianna & Stetsenko, 2006), is also consistent with QL. Janzen et al., (2011) suggest that the learning environment itself can be transformative as learners interact with each other, technology, instructors, and the actual environment. PV provides the environment, while social interaction is indicative of the interface between students, their instructor and technology. In PV these four QL facets (environment, students, instructor and technology) are all present. This combination of the four facets could contribute to the strength of the communities which are formed. Further, SDT sees these communities [and the individual members of these communities] not as "separate entities, but instead belonging together and interpenetrating each other" (Vianna & Stetsenko, 2006, p. 89).

Connections made through PV were a primary finding from the qualitative or focus group data analysis. In order for individuals to make connections they need to become acquainted with one another, to establish rapport (Tickle-Degnen & Roseenthal, 1990). The findings indicate that the majority of participants thought PV helped them get to know more about themselves and others in the course community. When they knew more about each other it created the possibility of rapport development as students might potentially discover they were in sync on certain ideas or issues.

Discovering more about self and others is also consistent with QL. The processes of discovering, and subsequently the application of those connections to one's own world, are felt to be two of the primary foci of learning (Janzen et al., 2011). This learning exists in a trajectory where the discoveries of connections are constantly being made. The connections between self and other are mediated, enhanced and operationalized through connections that are provided by technology and the environment. These connections according to Janzen et al. (2011) contribute to holistic learning and the creation of total quantum learning environments. These total quantum learning environments, in Vygotian terms, exist "where all... factors exist in interdependency and form... organic wholes [or] unified wholes... and become the source of growth and change for each other (Lui & Matthews, 2005, p. 397).

When individuals incrementally discover who they are and how others fit into their self-concept and self-knowledge, learning may be influenced on a greater scale. This is supported by Vygotsky's notion that "knowledge is not directly transmittable from person to person, but rather it is individually and idiosyncratically constructed or discovered" (Lui & Matthews, 2005, p. 387). PV may be a catalyst to this learning or discovery about self and other.

On a similar topic, the majority of study participants also responded that PV helped them to form distinct individual impressions of people in the course. This is also assurance that PV aided participants in getting to know each other. With this foundation of familiarity, developed in part by what was shared in PV, it may have been possible for community members to form connections with one another. These connections potentially promoted the experience of community.

Connections made need to be nurtured in order for them to develop further. QL suggests that quantum learning environments, such as in the environment and resultant community which PV can create, are not static in nature (Janzen et al., 2011). These environments grow, transform and adapt as do the individuals who interact within them. This growth or transformation requires nurturance and purposeful on-going interaction. Without interaction and the further discovery of connections, these environments instead of fostering connections and growth, wither and eventually cease to purposefully exist outside the immediate context of learning (2011). The on-going discovery of connections throughout the course trajectory creates opportunities for those connections to exist beyond the confines of the course itself. New PV learning activities are offered weekly, facilitating the on-going discovery of connections throughout the duration of the course.

In QL those connections, expressed in terms of infinite potential, have the possibility of existing and thus influencing individuals on a more holistic level. For Vygotsky, the very potential of students or learners is linked to "creative potentials" where there is constant interaction between student, environment and instructors (Davydov & Kerr, 1995, p. 13). In SDT, "collective" connections are felt to be "always larger than the total sum of individual persons" (Lui & Matthews, 2005, p. 392).

These connections can be carried forward into an ever enlarging awareness of the giant webs of connections that exist within human existence (Janzen et al., 2011). If everything is connected, entangled and communicates in a posture of holism, the connections that can be nurtured by PV may also have the capacity be carried onward. PV presents a milieu where nurturing connections can result in a growing sense of community, self, and other.

There is some indication from the responses to the question related to point of view being acknowledged by others that indicates respondents might have received affirmation and encouragement from classmates and or the instructor. A large majority of respondents did experience acknowledgement of their contribution to PV which could be a sign that connections were established, and it was likely that if the acknowledgement was ongoing throughout the course, connections might have been gradually strengthened.

Maslow (1948) identifies the need for acceptance as a precursor to self-actualization. With this in mind, acknowledgement or encouragement could be considered as necessary elements of creating connections. Further, motivation as described by Maslow (1950), is the determination of feeling accepted which capitalizes upon "the full use of… talents, capacities, [and] potentialities" (p. 150). This can result "in an ongoing process in which one's capacities are fully, creatively, and joyfully utilized" (PMC, 2009, para. 1). These findings are consistent with QL where potentialities have the capability for infinite development (Janzen et al., 2011). The initial creation of a single connection with another student or their instructor, when co-occurring with acknowledgement or encouragement, can create the necessary conditions for continued strengthening of connections. As subsequent connections are made with multiple students throughout the course in the context of PV, students create webs of connections which can foster stronger links within those connections.

PV may represent a safe place to develop those stronger connections. The PV environment has been explored previously as an environment which supports authentic voice, interaction and arises as an authentic medium for that expression (Janzen, Perry & Edwards, 2011). The authentic and intuitive inquiry that PV encourages, may additionally act as a medium to form connections in the PV environment. This may be realized through the processes of ongoing support and encouragement, which allows presentations of a variety of simultaneous lenses or worldviews by participants (Netzer & Mangano Rowe, 2010). As a result, students may be able to explore and "disclose their assumptions about a topic with honesty, integrity and authenticity" (pp.141-142). This may ultimately strengthen interaction and foster a deeper sense of connection. In terms of Vygotsky's SDT, truths expressed enhance connection and "make [and give] sense [and meaning] to the community" (Yilmaz, 2008, p. 168).

Did the arts-infused teaching strategy of PV help to facilitate the occurrence of interactions, formation of connections, development of rapport, and/or emerging of communities? As discussed in the literature review it is possible that the art aspect of the PV teaching strategy did promote creative thinking and instil energy, emotion, and enthusiasm in the group. If this occurred then rapport, interaction and community building might have been positively impacted. This is an area for further study.

In QL, Janzen et al. (2011) suggest that arts-based teaching strategies are representative of one of the most salient methods of enacting growth or learning in not only individual students but in all participants in a total quantum learning environment. PV could qualify as a total quantum learning environment which is represented as a living system (Janzen et al., 2011). If interactions, connections, rapport, and the sense of community all contribute to the living system's sustainability, then it is posited that the environment experiences positive growth and development. Within the QL context, PV may support a growing and developing environment which in turn may enact growth in those participants who interact with that environment. Creative teaching strategies, which include arts-based teaching strategies, have the potential to "increase energy, compassion, an enhanced self-

understanding and insight" (Lane, 2005, p. 123). This can result in an environment which can facilitate and celebrate "shared understandings" (Freshwater & Stickly, 2004, p.800).

Finally, the part the teacher plays in making APTs effective merits further research. As indicated in the literature review, researchers agree that the teacher is responsible (at least initially) for creating opportunities for interaction among course participants (Vitale 2010; Green, et al. 2010). We do not know from the limited findings what role the instructor plays in facilitating interaction, connection, and community in the online course. In relation to specific online teaching strategies like PV is it important how the teacher introduces and supports the activity? Does the way the teacher engages with PV influence the positive outcomes of this strategy?

Social Development Theory may help explain why social interaction among course participants, precipitated at least in part by PV, helped students get to know one another. When students became acquainted, and comfortable in the online classroom, connections could be made. It is possible that connections could give rise to meaningful relationships. The majority found these connections/relationships beneficial to their learning as Kim and Bayer (2006) suggest.

The Quantum Perspective of Learning (QL) adds additional insights to the research findings. Holistic environments such as PV may represent total quantum learning environments where students, technology, and instructors are linked to the environment itself (Janzen et al., 2011). These environments may give rise to communities which are strengthened and enhanced through the discovery of connections which also may enrich learning.

6. Conclusion

This paper explored graduate students' perspectives regarding the effects of the APT called PV on interaction in the online post-secondary classroom. Literature related to the role interaction plays in online teaching and learning, as well as discussion of how art-infused teaching strategies may enhance interaction, provided the foundation for the presentation of study methods and findings. SDT helps explain why social interaction triggered by PV is important to creating positive online learning environments. The effect PV has on the creation of total quantum learning environments was explored. These environments may give rise to communities which are strengthened and enhanced through the discovery of connections which also may enrich learning. Most participants in this study concluded that PV had a positive influence on interactions, the sense of community, their comfort in the online classroom and on their self-awareness and on their relationships with other learners and the instructor.

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References

Appana, S. (2008) "A review of benefits and limitations of online learning in the context of the student, the instructor, and the tenured faculty", *International Journal on ELearning*, Vol 7, No.1, pp 5-22.

Bohm, D. (1971) "Quantum theory as an indication of a new order in physics. Part A: The development of new order as shown through the history of physics", *Foundations of Physics,* Vol 1, No. 4, pp 359–384.

Bohm, D. (1973) "Quantum theory as an indication of a new order in physics. Part B. Implicate and explicate order in physical law", *Foundations of Physics,* Vol 3, No. 2, pp 139–168.

Brooks-Young, S. (2010) "Online teaching and learning: Set the stage for success", *Today's Catholic Teacher*, Vol 43, No. 4, pp 10.

Clarke, P. and Widdicombe (2002) "Making a new connection: Inner-city arts training program", *Education Canada*, Vol 42, No. 2, pp 44-45.

Crawford, P.D. (2001) "Educating for moral ability: Reflections on moral development based on Vygotsky's theory of concept formation", *Journal of Moral Education*, Vol 30, No. 2, pp 113-129.

Darrington, A. (2008) "Six lessons in eLearning: Strategies and support for teachers new to online environments", *Teaching English in the Two Year College*, Vol 35, No. 4, pp 416-421.

Davydov, V. and Kerr, S.T. (1995) "The influence of L.V. Vygostky on education, theory, research and practice", *Educational Researcher,* Vol 24, No. 5, pp 12-21.

Eastman, G. (1976) "John Dewey: Philosophy, psychology and social practice", *Studies in Philosophy and Education,* Vol 4, No. 1, pp 95-107.

Eccles, K. and Elster, A. (2005) "Learning through the arts: A new school of thought?", *Education Canada*, Vol 45, No. 3, pp 45-48.
Evans, R. and Champion, I. (2007) "Enhancing online delivery beyond PowerPoint", *The Community College Enterprise,* Vol 13, No. 2, pp 75-84.
Freshwater, D.and Stickly, T. (2004) "The heart of the art: Emotional intelligence in nurse education", *Nursing Inquiry,* Vol11, No. 2, pp 91-98.
Gallien, T. and Oomen-Early, J. (2008) "Personalized versus collective instructor feedback in the online courseroom: Does type of feedback affect student satisfaction, academic performance and perceived connectedness with the instructor?", *International Journal on ELearning*, Vol 7, No. 3, pp 463-477.
Garrison, D. R. and Anderson, T. (2003) *ELearning in the 21st century: A framework for research and practice*. London: RoutledgeFalmer.
Green, N., Edwards, H., Wolodko, B., Stewart, C., Brooks, M. and Littledyke, R. (2010) "Reconceptualising higher education pedagogy in online learning", *Distance Education*, Vol 31, No. 3, pp 257-273.
Hessler K. and Humphreys J. (2008) "Student evaluations: Advice for novice faculty", *Journal of Nursing Education*, Vol 47, No. 4, pp 187-189.
Holmberg, B. (2007) "A theory of teaching-learning conversation", In M. G. Moore (Ed.) *Handbook of distance education,* (pp 69-76). London, UK: Taylor & Frances.
Holmes, S.A. (2002) "Creative by nature: Integrating the arts into environmental science education", *Green Teacher*, No. 69, pp. 23-28.
Hong, H.Y. and Sullivan, F.R. (2009) "Towards an idea-centred, principle-based design approach to support learning as knowledge creation", *Educational Technology Research & Development*, Retrieved from www.springerlink.com/index/220r77mn74712767.pdf, doi: 10.1007/sl 1423-009-9122-0
Perry, B. and Edwards, M. (2010) "Creating a culture of community in the online classroom using artistic pedagogical technologies". In G. Veletsianos (Ed*.) Emerging technologies in distance education.* Edmonton, Alberta: AU Press.
Janzen, K.J., Perry, B. and Edwards, M. (2011) "Aligning the Quantum Perspective of Learning to instructional design: Exploring the seven definitive questions", *International Review of Research in Open and Distance Learning,* Vol 12 , No. 7, (forthcoming).
Janzen, K.J., Perry, B. and Edwards, M. (2011) "Becoming real: Using the artistic pedagogical technology of photovoice as a medium to becoming real to one another in the online educative environment", *International Journal of Nursing Education Scholarship,* Vol. 8, No. 1, Article 6.
Jones, J., Warren, S. and Robertson, M. (2009) "Increasing student discourse to support rapport building in Web and blended courses using a 3D online learning environment", *Journal of Interactive Learning Research*, Vol 20, No. 3, pp 269-294.
Kim, Y. and Baylor, A. (2006) "A social-cognitive framework for pedagogical agents as learning companions", *Educational technology research and development*, Vol 54, No. 6, pp 569-596.
Kretschmann, D. and Werner, R.F. (2005) "Quantum channels with memory". *Physical Review A,* Vol 72, No. 66, pp. 1–20.
Lane, M.R. (2005) "Creativity and spirituality: Implementing art in nursing", *Holistic Nursing Practice,* Vol 19, No. 3, pp. 122-136.
Levine S. J. (2005) "Instructional design considerations for distance education programs". In Levine S. J., (Ed.), *Making distance education work: Understanding learning and learners at a distance* (pp 37-42). Okemos, MI: Learner.
Lui, C.H. and Matthews, R. (2005) "Vygotsky's philosophy: Constructivism and its criticisms examined", *International Education Journal,* Vol 6, No. 3, pp. 286-389.
Maslow, A.H. (1943) *A theory of human motivation, Psychological Review*, Vol 50, pp. 370-396.
Maslow, A.H. (1950) *Motivation and personality,* New York: Harper & Rowe.
Mak, L. and Yeung, S. (1999) "Investigating features of an international e-mail community". In K. Cameron (Ed.), *CALL and the Learning Community*. Exeter: Elm Bank.
Netzer, D. and Mangano Rowe, N. (2010) "Inquiry into creative and innovative processes: An experiential, whole person approach to teaching creativity", *Journal of Transformative Education,* Vol 8, No. 2, pp. 124-145.
Perry, B. (2006) "Using photographic images as an interactive online teaching strategy", *The Internet and Higher Education,* Vol 9, No. 3, pp 229-240.
Perry, B. and Edwards, M. (2010) "Interactive teaching technologies that facilitate the development of online learning communities in nursing and health studies graduate courses". *Teacher Education Quarterly*, Special online edition. http://www.teqjournal.org/perry_edwards.html.
PMC (2009) "Self-actualization", Retrieved from http://www.abraham-maslow.com/m_motivation/Self-Actualization.asp
Pribram, K.I. (2006) "Holism vs. wholism", *World Futures,* Vol 62, No.1&2, pp. 42-46.
Richardson, J. and Swan, K. (2003) "Examining social presence in online courses in relation to students' perceived learning and satisfaction", *Journal of Asynchronous Learning Networks*, Vol 7, No. 1, pp 68-88. Retrieved from http://www.sloan-c.org/publications/jaln/v7n1/pdf/v7n1_richardson.pdf
Rovai, A. P. (2002) "Development of an instrument to measure classroom community", *Internet & Higher Education*, Vol 5, No. 3, pp 197-211. Retrieved from http://dx.doi.org/10.1016/S1096-7516(02)00102-1
Skinner, B.F. (1954) "The science of learning and the art of teaching", *Harvard Educational Review,* Vol 24, No. 2, pp. 86-97.

Tickle-Degnen, L. and Roseenthal, R. (1990) "The nature of rapport and its nonverbal correlates", *Psychological Inquiry*, Vol 1, No. 4, pp 285-293.
Upitis, R., Smithrim, K. and Le Clair, J. (2001) "Teachers as artists: Producing an 'instant opera'", *Education Research*, Vol 3, No. 2, pp 111-119.
Vitale, A. (2010) "Faculty development and mentorship using selected online asynchronous teaching strategies", *The Journal of Continuing Education in Nursing*, Vol 41, No. 12, pp 549-56. Retrieved from ProQuest Education Journals. (Document ID: 2200776471).
Vygotsky, L.S. (1978*) Mind and society: The development of higher mental processes.* Cambridge, MA: Harvard University.
Vygotsky, L.S. (1987) "*"The collective works of L.S. Vygotsky Vol. 3."* R.W. Rieber & A.S. Carlton (Eds.) New York: Plenium.
Wang, C. C. (1999) "Photovoice: A participatory action research strategy applied to women's health", *Journal of Women's Health*, Vol 8, No. 2, pp185-192.
Wang, C. and Burris, M. (1997) "Photovoice: Concept, methodology, and use for participatory needs assessment", *Health Education Behaviour*, Vol 24, No. 3, pp 369-387.
Yilmaz, K. (2008) "Constructivism: Its theoretical underpinnings, variations and implications for online instruction", *Educational Horizons,* Vol 86, No. 3, pp. 161-172.
Young, S. (2006) "Student views of effective online teaching in higher education", *The American Journal of Distance Education*, Vol 20, No. 20, pp 65-77.
Yungbluth, S. and Bertlno, S. (1996) Extending the borders of community and learning with electronic mail discussion lists. Retrieved October 10, 2007, from http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmlnl.jsp?_nfpb=true&_&ERICExtSearch

