BUILDING BLOCKS: ENMESHING TECHNOLOGY AND CREATIVITY WITH ARTISTIC PEDAGOGICAL TECHNOLOGIES

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ABSTRACT

Using the analogy of children's building blocks, the reader is guided through the results of a research study that explored the use of three Artistic Pedagogical Technologies (APTs). 'Building blocks' was the major theme that emerged from the data. Sub-themes included developing community, enhancing creativity, and risk taking. The discourse of the paper centers on how selected APTs stimulate interaction, create social presence, and help develop community in the online post-secondary classroom. Additional findings are discussed and implications are presented.

Keywords: **Creativity, technology, e-learning, artistic pedagogical technologies, creative arts-based learning, social presence, social interaction.**

INTRODUCTION

Artistic Pedagogical Technologies (APTs) are creative arts-based instructional strategies. Research conducted from 2006 to the present demonstrates that APTs enhance teaching and learning in the post-secondary educative environment. While it is known that APTs are effective, it is less clear why and how they are effective especially in the triad of stimulating interaction, creating social presence, and helping develop community in the online post-secondary classroom. Why APTs are effective has been, and continues to be, theoretically explored and refined through writings and research related to The Quantum Perspective of Learning (Janzen, 2013; Janzen, Perry & Edwards, 2011a; 2012a; 2012b; 2012c).

The purpose of this paper is to present the results of a research study that explored *how* selected artistic APTs stimulated interaction, created social presence, and helped develop community in the online post-secondary classroom. A brief literature review focused on creativity and the intersection of technology and creativity in the post-secondary educative environment is presented. The background of APTs is delineated. The research question and methods are presented. Results and discussion are explored. Implications for practice and further research are offered. Limitations of the research are explicated.

LITERATURE REVIEW

Creativity

The first recorded musings on creativity were addressed by Plato in Greco-Roman times and creativity was thought of as being a god-like trait (Hendriksen, Mishara & the Deep-Play-Research Group Michigan State University, 2014). Hendriksen and colleagues explain that this notion of creativity evolved over time until the Renaissance period where a creative person was thought to be unique or gifted, but still in a mystical way. This thinking was sustained until Shakespearian times. Even Shakespeare in his writings "doubted the absolute originality in creative work" (p. 16). While agreement that certain individuals are better at creativity than others has been sustained through time, creativity was thought of in the early 19th century as simply the art of "drawing from existing sources" (p. 16). In the 20th century, thinking related to creativity was thought of much the same way.

Beginning in the 1950's creativity has now been researched for six decades (Cummins, 2013). Creativity is still thought of and defined in many ways, but essentially circumscribes the idea that creative individuals work with possible variations of ideas or themes to "produce something novel, effective, and/or esthetically pleasing" Hendriksen et al., 2014, p. 16). McCormack and d'Inverno (2014) outline, in particular, that Boden's (2010) definition acts as a starting point in understanding creativity. Boden cites that creativity incorporates ideas which encompasses the novel, envelops the surprising, and elicits the valuable. In her seminal work, *The Creative Mind* (1990) she pioneered the construct of academic creativity.

Technology, Post-Secondary Education and Creativity

Today, we live in an era where technology is often deemed to be outdated by the time it is mass produced and reaches the user (Thong & Calvin, 2014). We have moved far from Web 1.0 technologies where the first courses were delivered via the web in 1994 (Hill, 2012; Pence, Williams & Bedford, 2015). Web 2.0 technologies have become ubiquitous and now we are beginning to utilize Web 3.0 technologies within semantic webs (Pence et al., 2015). We are considered to be existing in a Social 3.0 society (Moravec & van der Hoff, 2015). In this 3.0 society, Moravec & van der Hoff describe one in three of the United States' workforce as "knowmads" or "nomadic knowledge workers [who] can instantly reconfigure and recontextuallize their work environments" (p.3). It is and estimated that knomads will balloon to 45% of the workforce by 2020 (Disney, 2013; Moravec, 2013; Moravec & van der Hoff, 2015).

The face of online education and online learning environments are continuing to change. Rapid advances of technology provide both students and instructors with a multitude of choices not even imagined five years ago. If this frenetic pace continues it may push institutions, course designers, as well as teachers and students in even more novel directions as they try and keep pace with the technological explosion.

Gadgets, apps, smart phones, and tablets are continuing to morph (Odora & Matoti, 2015) which has ties to what the millennial learner may need technologically in terms of software and programs to remain engaged in the post-secondary learning environment in the next five to ten years (Janzen et al., 2012b). Internet technology and resultant skills taught today in all areas of post-secondary education have been purported for some time now to have become obsolete before students even finish their education (Cummins, Kunklel & Walker, 2015; Lightfoot, 2006). With the recent worldwide economic crisis and the resultant negative impact

on educational funding, how can post-secondary institutional budgets keep pace with technological advances in the face of shrinking resources? The answer may lie in enmeshing technology and creativity in the development of low cost technologies that deliver multiple benefits for students, instructors, and post-secondary institutions (Minuto, Pittarello & Nijholt, 2014).

Today, computers and creativity are creating "seismic changes" in education (McCormack & d'Inverno, 2014 p. 2). As a society, we have now generated machines that can learn (McCormack & d'Inverno, 2014) which incites exponential possibilities in education. Virtual worlds are being increasingly used as "contexts for creativity" (Alahuhta, Nordbȁck, Sivunen & Surakka, 2014, p. 16). While at one time highly skilled technicians developed interactive systems (Minuto et al., 2014), the creation of content is now being produced by teachers and students in a creative context of "social software" into e-Learning 2.0 (Toming & Lamas, 2014, p. 3). This has been largely accomplished by utilizing Web 3.0 technology and tools (Janzen et al., 2012a).

The gap between technology and creativity is being narrowed as teachers and students "take control over the creative process" (Minuto et al., 2014, p. 141) ensuring that creativity still resides within the "human ability to engage in everyday creative skills" (McCormack & d'Inverno, p. 2). This, then, becomes the enmeshing of technology and creativity. This is the hallmark of Artistic Pedagogical Technologies (Perry & Edwards, 2010a; 2010b).

BACKGROUND

Artistic Pedagogical Technologies

Artistic pedagogical technologies (APTs) are creative arts-based teaching strategies and have the features of Web 3.0 technology (Janzen, Perry & Edwards, 2012a). APTs include literary, visual, musical, or drama elements and are distinguished from customary teaching strategies by their emphasis on aesthetics and their heightened connection to creativity (Perry & Edwards, 2010a). APTs were first pioneered by Perry (2006) over 10 years ago. Perry posited that technology could be melded with the creative arts to produce teaching strategies which could have benefits for both students and instructors in the post-secondary online learning environment. Starting with just a single APT, Photovoice was developed as a derivative of Wang and Burris' (1977) action research. The research team of Perry, Edwards and Janzen have gone on to create and research new APTs.

Research has explored APTs and how APTs positively influence post-secondary online learning environments and student learning (Perry and Edwards (2006; 2010a; 2010b; 2012; Perry, Edwards, Menzies, & Janzen, 2012; Perry Mahler & Edwards, 2009). APTs help provide a real and authentic medium for instructors and students to engage with one other, with technology and with educational content (Janzen, Perry, & Edwards, 2011b; 2012a), create inviting learning environments (Perry & Edwards, 2012), initiate, sustain, and enhance interaction between students and instructors, and help develop community (Perry & Edwards, 2010b, 2012; Perry, Janzen, & Edwards, 2011). Further, the use of APTs stimulate creative thinking, capture student attention (Perry, 2006), extend the application of course content, contribute to positive learning outcomes, and help develop a sense of professional fulfillment for instructors (Perry & Edwards, 2010b).

APTs contribute to students establishing a sense of group identity (Perry et al., 2011), support course engagement, enhance the learning environment, and develop social connectedness (Perry, Dalton, & Edwards, 2009). Finally, students report a positive influence on not only course interactions, but on their sense of community, increased comfort in the educational milieu, and learners note that APTs aided them in getting to know themselves, classmates, and

instructors (Edwards, Perry, Janzen, & Menzies, 2012). Through Perry and Edwards' (2010a; 2010b; 2012) research, a collection of APTs appropriate for use in a variety of disciplines have been developed and evaluated. The collection of APTs continues to grow (Janzen, 2013; Perry, 2013).

METHODOLOGY

The purpose of this study was to increase understanding of *how* selective APTs stimulate interaction, create social presence, and help develop community in the online post-secondary classroom.

A purposive sample included students (N=60) from 2 faculties of nursing in Western Canadian universities. A convenience sample of the teachers (N=16) was also invited to participate. These teachers taught the classes in which the APTs were used. Student participants consented to complete online quantitative questionnaire and a sub-set consented to participate in online focus groups during which qualitative data were collected. Teachers consented to participate in online focus groups only. The research study was approved by the Research Ethics Boards of both universities.

The quantitative 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 sent to participants electronically to an email addresses they had provided when they consented to participate. Questionnaires were sent to student participants by the research assistant and completed questionnaires were returned to that same research assistant. The research assistant complied the data so identifiers could not be associated with any particular responses. A total of 15 students completed the questionnaire for a participation rate of 25% in the quantitative element of the study.

Qualitative data were collected from students and teachers using secure, private, online focus groups. The actual number of participants in the online focus groups was teachers (N=4 for a participation rate of 25%) and students (N=7 for a participation rate of 12%). Quantitative data were analyzed using descriptive statistics and qualitative data were analyzed for themes using NVivo10 (QRS International, 2015) qualitative data analysis software.

Three APTs were used in this study: Photovoice, Parallel Poetry, and Conceptual Quilting. Photovoice consists of a photographic image with an accompanying reflective question which the students respond to. Parallel poetry involves a poem written by the teacher and then a poem written by the student which reflects or parallels the teachers's poem. Existing poems by other authors can be used by the teacher or the teacher can write a poem themselves. Conceptual quilting involves students and teachers creating electronic 'quilt squares' filled with concepts, ideas, or themes from a completed course that stood out for them. The completed quilt squares are fashioned into an electronic whole quilt electronically which is subsequently shared with the teacher and classmates in a quilt gallery. Teachers and students 'walk' through the gallery, view the quilt collection and then engage in discussion of common themes and reflections.

RESULTS

Quantitative Results

All 15 students who completed the questionnaire were completing a master's degree in nursing, health studies, or a nurse practitioner program. All participants resided in Canada with the majority (80%) living in Alberta, Ontario, or British Columbia. One study participant

had only completed one online course (the course included in the study) while the others (93.3%) had completed two or more online courses including the study course.

In response to the question that asked if APTs 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%) found that APTs had a positive influence on their learning.

When asked if online education is an excellent *medium for social interaction* as demonstrated by APTs, (33.3%) were neutral. The majority (67.7%) were positive. Specifically, 6/15 students agreed, and 2/15 students strongly agreed, that APTs demonstrated online education was an excellent medium for social interaction.

Students were asked if APTs enabled them to form a *sense of community* online. The majority of respondents (50%) were neutral, but this time 1/15 students (8.3%) disagreed indicating that APTs were 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 APTs helped with community formation in their online course.

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.

When asked if they felt comfortable interacting with other participants in APTs, 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.

The statement that read, "My point of view was acknowledged by other participants during APTs," 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 APT learning activities. The remainder of respondents 3/15 were neutral on this point with no students marking a negative response.

Participants were asked if they came to know themselves, other students, and the instructor through APTs. Several participants (5/15) were neutral while 5/15 agreed that they did get to know others through APTs. Further 2/15 (16.7%) strongly agreed that APTs helped them get to know course participants. There were no negative responses.

Another question asked students if they were able to form distinct individual impressions of some course participants by their APT participation. 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 APT participation.

The last question asked if the respondents felt the learning in the course was positively influenced by APTs. One person marked disagree indicating that APTs 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 APTs positively influenced their learning in the course.

Qualitative Results

The major theme that emerged from the data was 'building blocks.' Sub-themes included developing community, enhancing creativity, and risk taking. This theme and sub-themes are explored in this section of the paper.

Building blocks

As children, many played with building blocks—wooden blocks featuring colorful alphabet letters and/or animals. One would build structures with these blocks with an ultimate objective of seeing how high the structure would become without toppling over. It was soon learned, through trial and error, that the blocks needed a broad foundation upon which to rest resulting in a stronger structure.

It was also learned that there could be spaces within the enlarging structure which added to the height of the structure without compromising strength. Last, the structures that were built were as individual as the creators of the structures themselves. Each structure was representative of the different aspects or imaginations of the builders. No two structures were exactly alike. Through the activity of creating structures through the use of building blocks there were benefits such as developing dexterity, furthering imagination, encouraging creativity, and fostering learning. When playing with other children, the structures built developed a sense of community between those that participated, furthered the creative natures of the individuals that were participating, and allowed the builders to engage in risk taking before either the structure toppled to the ground or the last building block was used. Using the analogy of the building blocks, the builders are the students and teachers acting as individuals and co-builders. The blocks become representative of the various APTs employed in this research. The finished structures are closely aligned with the building blocks of learning and the resultant benefits of utilizing APTs in in the online classroom. The variety of the structures created represent creativity enmeshed with technology.

To illustrate the building block metaphor, phrases "putting things together" and "building upon" emerged from the data. For example, one teacher participant remarked,

> **I think one of the things is that, we are kind of looking at their ways of *putting things together.* And of course they have various learning styles, but some people were very creative and I think they enjoyed the exercise because of that, and I think they were able to use their creativity and kind of integrate all the learning theories and concepts from the course. (Italics added)**

Another student participant noted that APTs were "a great tool to *build upon* . . . current knowledge, rather than repeating what [had been] already learned about" by "pulling together course concepts and sharing [them thereby] creat[ing] discussion." (Italics added). As an instructor participant noted, APTs enabled participants to "grasp connections between important elements." Additionally, APTs were seen as a tool that could aid in "verifying that learning [had] taken place" (instructor).

Several other benefits were seen as a result of engaging in APTs. One student participant remarked that APTs "enabled me to learn what I wanted to or needed to learn." Another student said, "each week was kicked off with a different teaching tool, which was very useful at capturing attention and driving the desire to learn." Another learner commented involvement went "beyond having to participate in order to get a grade" and "the activities in the course invited [students] to think beyond course requirements." A teacher concluded that this encouraged 'individualized self-expression, as well as collaborative learning, and help[ed learners] to better understand and integrate training content." Participants concluded that APTs "inspired a richer conversation," and "professionally and educationally, APTs opened

mind[s] to additional effective teaching/training, and learning strategies helping to promote online social interaction, content integration and collaborative learning." In sum, within the use of APTs in this research study, community was developed, creativity enhanced and risk taking embraced.

Developing community

Developing community, like building participative structures with building blocks, involved a sense of being not only co-creators in the development of content but also involved engaging in an interactive nature with other students, teachers, technology, and ultimately with the learning environment. The result was a learning environment that participants commented felt "real." One student remarked that "the active interactions elicited by APTs felt very real and meaningful" while another said, "I couldn't say that I ever felt [the] online course did not feel 'real.' The work, forum contributions, assignments, and extra discipline required, are quite real."

Participants became 'real' to each other though sharing their perceptions and assignments with each other. One teacher expressed, "by encouraging students to express themselves through poetry, concept quilting, or Photovoice, for example, I found that we got to learn a bit more about each other's experiences, talents, and perspectives." A student commented about the conceptual quilt saying, "we were actually going to share it so I could see that forming a sense of community for sure." This sense of community was enhanced through the development of a "culture… in the class environment where [students] wanted to participate" (instructor). The result was an environment where students "took the time to interact more with [their] classmates and instructor." This allowed, "through the use of APTs," getting "to know classmates more" and "led to a sense of collegiality [in] the forums."

This collegiality was perhaps best expressed in a poem a teacher shared in one of the discussion forums where parallel poetry was utilized. This was the teacher's first attempt at sharing his/her own poetry.

I am your teacher
I answer your questions,
I reply to your emails,
I give you advice,
I inspire your learning,
I challenge you to do your part,
I am your teacher.

I have your best interest at heart,
I help you to critically think,
I guide you to knowledge fountains,
I encourage you to drink,
I grade your work with care,
I am your teacher.
I empower you through self-direction,
I lead you by example.
I give you timely feedback,
I appreciate your worries,
I try to meet your needs,
I am your teacher.

I am committed to you,
I understand your challenges,

I praise your accomplishments,
I want you to succeed.
Let me inspire you
Like you inspire me
Let me help you grow
I am your teacher.
And you also teach me,
We are partners,
In your journey to success.
You learn from me,
I learn from you,
We will be changed forever.
I am your teacher.

Enhancing creativity

Just as building structures with building blocks requires a sense of creativity as the structure emerges, APTs engendered and encouraged a sense of creativity in both learners and teachers. This creativity was both individual and collective in nature. One teacher expressed the individual and collective nature of APTs in saying that "APTs provide another tool to engage learners' creativity." Another teacher expressed it much the same way in that APTs "tapped into their creative ability" which was then shared and discussed with each other in further creative ways.

Within the discipline of nursing, there exists an art and a science both professionally and educationally. Creativity may have infused an essence of 'art' into traditionally 'science' based theory courses. This is illustrated by one student who remarked "the assignment encouraged creativity, blending theoretical concepts into an art form" and another commented that "it was a creative way to express a generally text-based course into something visual." One teacher expressed it this way:

> **"For me it was the use of creativity to be able to pull the course concepts together in a different way instead of a more-I guess you would say-a traditional way. This is just something that is different and I think they enjoyed it."**

The students enjoyed these types of activities as well. One student stated, "I personally enjoyed these types of things because I've always enjoyed things that are creative." Another student put it this way:

> **"I think it just—it helps with the students' learning when they can tap into some of their creative abilities and pull things all together and I think that people don't realize is how much, when they are doing the activity, just how much they are having fun and enjoying it."**

As well as having fun, creative processes were enacted. The teacher who wrote the poem which was previously cited, commented: "I surprised myself with the poetry exercise as I never imagined that I could create any type of poetry." This sense of accomplishment and creativity however, involved risk taking.

Risk taking

Building structures with building blocks requires an element of control and risk taking. Control involves a steady hand and the creative and purposeful placement of the building blocks. Risk taking is also evident in that the builder(s) cannot be 100% certain that with each successful block being placed whether the structure will topple to the ground. However, the builder(s)

continue to build despite that risk and the emerging structure validates and lessens that sense of risk as positive outcomes are realized.

Although APTs involved risk taking, APTs also gave a sense of "control over the learning environment" for both teachers and students. Some of that control came because of the element of choice. Participation in APTs was optional and not graded giving participants choice in terms of their involvement. This choice was encapsulated in "picking learning activities," "develop[ing] and direct[ing one's] own learning," and the "choice of learning activities to meet [one's] own learning needs." "Aha" moments were one of the benefits of risk taking. One participant expressed his/her reactions to another student's conceptual quilt. "It was very evident from her quilt what she was trying to say and what she learned so when the other students did see it they kind of had that aha moment."

Students and teachers "open[ed] up (creatively) with [their] peers about [their] feelings." This opening up was a reciprocated experience where instructors took "risks, so, [students] felt safe to do the same." A teacher expressed the level trust students had in both their peers and their instructor:

> **"Like when you are doing the conceptual quilt there has to be a level of trust I believe for the student to be able to share with you their thoughts and feelings about a particular concept, I found that some of the pictures that students used really demonstrated the student's personalities. For them to be able to use specific pictures that represented them I feel that they had to trust the instructors and probably the class as they shared this with them."**

Two students remarked on the need for mutual respect that accompanied the sharing in the conceptual quilting exercise in that the sharing could "be personal." This was illustrated in the following comments: "respect… I think it is just providing respect for others if you are sharing with other people or commenting on [their work]" and "I found it also contributed to a neutral sharing ground for all, and a safe place to do so." Further, one instructor commented, "On a personal level APTs helped [students] be less afraid to express [themselves] or tap into potentially hidden talents." APTs also increased interactivity, and students were willing to express themselves in a way that at times created some vulnerability as the following instructor quote illustrates.

> **"Students were generally more interactive with ATPs, including those who appeared to be shy at first. They seemed more eager to 'let their hair down' and share their professional and personal experiences while integrating course content. I also found that students seemed to encourage and compliment each other more during ATP exercises and didn't mind showing some vulnerability."**

DISCUSSION

To return to the analogy of building blocks, a solid foundation has been built over the past 10 years which has demonstrated the many benefits of APTs. A tower or educational teaching structure has been built block upon block, year by year, and research study upon research study. There remain spaces in the structure which have allowed the developing knowledge base of APTs to be continually explored and added to. This research represents the first study to explore *how* APTs 'work.'

APTs could be seen and understood much like building a structure through the use of building blocks. Instead of envisioning how high the APTs (the structure) can become, APTs can be seen as a multitude of learning technologies that enhance or broaden the learning experience

for students and teachers alike. The spaces between the building blocks or APTs represent fluidity instead of stasis—therefore allowing APTs to continue to develop in breadth and depth. As well, research involving APTs continues to evolve and exploration is recurrent as new questions arise.

Thus, the APTs are not cemented together but represent a plasticity as a medium to enmesh the APTs, students, teachers, and the learning environment together with technology. This is supported by the tenets of the SITE Model which espouses that for learning environments to be successful, all elements (students, instructors, technology and environment) must be present and intersect resulting in Quantum Learning Environments that grow evolve and are living environments (Janzen et al, 2012a). This then, can create learning environments that are 'real' (Janzen et al., 2010) and invitational (Janzen et al., 2011c; Perry, 2013) despite the online nature of the course delivery. From the findings of this study, students *want* to participate and their participation can invite both teachers and students to share not only their thoughts and feelings but also their experiences. APTs provide a venue for members of the class community to reveal elements of their personalities, attitudes and values in an appropriate way. Doing so helps students and instructors to get to know one another in a more human to human way even through the mechanisms of the online course.

The plasticity which exists can allow each student and teacher to see and utilize APTs in unique ways, furthering learning and enhancing creativity. It is posited that no two people see APTs exactly alike, which allows and encourages creativity. For example, in the APT, Photovoice, each individual sees something different within the images that are presented. Each Photovoice then, becomes as unique as the individual that works with the images and results in a multitude of different expressions through words and images. Diversity becomes evident and valued by the class community.

Additionally, on occasion sometimes similarities and commonalities are revealed as learners participate in APTs. For example, if two students create conceptual quilts that highlight similar elements of the course, this gives fodder for the formation of alliances and even friendships furthering the sense of connectedness and community in the class. When two students see the same thing in a Photovoice image and share this in the public forum of the online course they are often pleased to discover a kindred spirit in the course. This finding of someone who shares something in common with them often results in the two working together on a course project or interacting activity in a discussion forum. Learners become engaged and discussions achieve depth in part of what appears at first to be a simple APT.

APTs can create community through the sharing of multiple mediums that APTs represent. The building blocks, then, become those of sharing, shared experience, trust, and respect. This, as in the building blocks, helps to create and further develop a strong foundation upon which to build community. Essentially community seems to be created within a virtual world which is 'real' to those that frequent it, populated by 'real' people and filled with 'real' experiences through the use of 'real' APTs.

The sense of community is referred to as "co-presence" in the virtual world (Alahunta et al., 2014, p. 7). This co-presence is mediated by the shared experiences of teachers and learners and is "embraced by immersion" (p. 7). APT assignments can immerse students and teachers into a virtual world that can become a virtual community. This community, although not long-term as it does not extend past the confines of the course work, can be very 'real' to all participants for the time they are part of that community.

Additionally, APTs can create virtual worlds by utilizing familiar learning objects such as photographic images, quilts, and poems. Through mutual or dual-learning—or as Brooks,

Borum and Rosenørn (2014) term it, "joint-learning" (p. 37), learning seems to arise from the use of familiar objects and participants' encounters with each other's sharing. In essence, this dual-learning can be conceptualized as building a community together just as in building a structure out of building blocks as a collective activity. It has been said in a traditional African proverb, that it takes a whole village to raise a child (Healy and Salaam, 1998). Likewise, it is posited that it takes all learners and each teacher to build a virtual community. The class community building becomes a communal effort (1998) and the collective efforts of all are needed help create virtual communities that are strong and healthy. Thus, the building blocks do not topple and builders (teachers and learners) can go on to greater heights, insights and learning.

For example, through the use of Conceptual Quilting, each student or teacher creates a different quilt and when the quilts are shared with one another, the opportunity to further enhance the learning of others in the online classroom can occur in a rich and deep way. In poetry, the prior and current personal wisdom and knowledge of both the writer and the reader can intersect as thoughts and feelings are shared in an atmosphere of vulnerability and acceptance. This depth of such sharing involves risk taking which was seen by students and teachers alike to be an affirming experience in this study which lends itself to further developing community.

Enmeshing Creativity and Technology in the Post-Secondary Learning Environment

As one participant remarked, "technology and creativity were two of the components that were embraced." We suggest that technology and creativity become enmeshed in the use of APTs. Etymologically speaking, the word enmeshed is derived from the 1530's meaning to become entangled or involved (*Online Etymology Dictionary* 2015a, para 1). More recently in 1944 enmeshment constituted to "put in" or "to involve" (para 1). Further, the word entangle from the early 15th century Latin, has ties to "interweaving" (*Online Etymology Dictionary*, 2015b, para 5).

When creativity and technology, such that is enveloped in APTs, becomes enmeshed then positive results can be seen. Creativity enhances high level meta-cognitive processes (Liu, Lin, Jian & Liou, (2012) while technology diversifies the experiences of learners and is thought to "enhance cognitive flexibility and creative thinking" (Kuo, Chan & Hwang, 2014, p. 221). APTs could be considered as "creative tools" just as computers are seen as creative tools (McCormack & d'Inverno, 2014, p. 2). Further, the intertwining of computers and creativity are felt to enrich the social and the cognitive (p. 8). When the virtual combines with creativity, sustained cognitive engagement occurs (Mason, 2014).

APTs can enable the inherent art of a discipline to emerge rather than focusing solely on the traditional science of that discipline. Frei, Alverez and Alexander (2010) echo this in saying that involving the creative arts in education, "provides a memorable educational experience that provides new ways of thinking about educational concepts and complements the dominant scientific pedagogy" (p. 672). Thus teaching is encountered in the affective domain which effectively creates an "intersection of science and art" (Frei et al, 2010, p. 676; Henriksen et al., 2014). Artistic practices such as APTs are closely interwoven with human creativity at a "raw and visceral" level (McCormack & d'Inverno, 2014, p. 3) often at a level of the very 'being' of students and teachers alike as they take risks and succeed. APTs as the technology can allow an intertwining of creativity to emerge to enhance that sense of truly 'being-in-the-virtual-world' (Heidegger, 1962).

IMPLICATIONS

Software development is a lucrative business in today's world of technology. In addition, the procurement of innovative, creative software can be an expensive venture for post-secondary institutions. Thus, technology can be considered to be a "double edged sword" (Thong & Calvin, 2014, p. 50). The response to the high costs of technology in online post-secondary education has been to continue to primarily use traditional forms of teaching and technology such as reading, discussion boards (Brooks et al., 2014) and online forums. Providing low-cost technologies which enmesh with creativity may be one solution that has been overlooked for far too long. APTs can provide both cost effectiveness and harness creativity. Ultimately APTs can have substantial prospective in building invitational virtual structures or virtual environments, creating social presence, and developing virtual communities. We posit that these are of great value.

This value can be both communicated and transferred to the generations that follow. This can be envisioned in building even better online educational institutions than exist in today's millennial world—a future online educative world in which technology is unequivocally enmeshed with creativity. In the precise combination of benefits that APTs allow, virtual worlds have the potential to merge in today's society as effective, cost-worthy technological and creative tools for educational institutions, teachers, and students alike.

LIMITATIONS

There are several limitations in this research. First, the results are not generalizable due to the small sample. In quantitative research the aim is generalizability while the purpose of qualitative research is not directed to generalizability (Cresswell, 2013). A mixed methods approach however, strengthened this research. A mixed methods approach combines the strengths of both quantitative and qualitative research while lessening the inherent weaknesses of either one by itself (Onwuegbuzie & Johnson, 2006).

While a small sample in quantitative research lends less generalizability to the research results, a small sample of six to eight in focus groups is considered to be adequate and results in richer data (Kreuger and Casey, 2009). Further, restricting focus group size counters the limitations of focus groups due to the use of more than one focus group, the development of reflective questions to promote thinking and sharing, and inviting all group members to provide a voice. The constraints of the focus group were also mediated by the number of accesses on the secure, online focus group blog page (n = 111). Participants appeared to be highly engaged in the focus group. Kreuger and Casey also outline criticisms of focus groups, namely, possible intellectualization, focus group members lacking emotion, participants creating fictitious data, and dominant individuals influencing results.

CONCLUSION

In this paper research pertaining to a collection of four selected APTs, was explored. This exploration pertained to *how* APTs stimulate interaction, create social presence, and help develop community in the online post-secondary classroom. The theme of 'building blocks' was identified along with three subthemes: developing community, enhancing creativity, and risk taking. Methodology and results were presented. An examination of the dominant theme and sub-themes followed. A discussion was undertaken related to the themes. Potential implications as well as limitations of the research summed up the paper.

This research has presented several conclusions regarding *how* selected APTs can enhance the online classroom in very specific ways. Using the analogy of children's building blocks helps

the reader to understand APTs in new ways by utilizing these familiar objects. The building blocks presented generate not only a foundation for helping to understand how APTs work, but also a springboard to envision how creativity and technology can merge in the online educative environment more meaningful, purposeful, and thoughtful ways. It is hoped that through additional research these processes will become better understood.

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