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Community Building in Online PBL Courses: Instigating Criticality

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Abstract

As post secondary institutions continue to endeavor to address changing stakeholder expectations and *policy directions, new curriculum models that allow for choice and learner flexibility are required. One approach that shows promise in this area is online problem-based learning (PBL). This paper discusses a case-study of the implementation of a problem-based learning pedagogical framework that fosters the development of meaningful teacher-learner; learner-learner, and learner-content relationships (vanOostveen & Desjardins, 2013) in an online Bachelor's program in adult education and digital technology. Within this context, the attributes and affordances of a program design model on facilitating online community are examined.*

Keywords: problem based learning; online community; adult education; digital technologies; pedagogical model

Introduction

As identified by Trow (2006), there is an increasing demand for access to student spaces at the post-secondary level due in part to the pressure for the democratization of education. In addition, with increased access to mobile technologies, education is shifting to a more self-directed model where "teachers, learners, networks, connections, media, resources, tools create a unique entity that has the potential to meet individual learners', educators' and even societal needs" (Gertstein, n.d.). In response to this demand for access, many post-secondary institutions have been turning to online course and program options as a potential option for meeting challenges of increased enrolment and limited physical space. In parallel, some post-secondary institutions view a shift to online learning as a way to meet the needs of the knowledge age learner (Bates & Sangra, 2011). In Ontario, the Ministry of Training Colleges and Universities (MTCU) has been calling for post-secondary institutions to consider offering a great number of online courses and programs (MTCU, 2012) and has recently announced the creation of a Centre of Excellence for Online Learning (MTCU, 2014).

As post secondary institutions continue to endeavor to address changing stakeholder expectations and policy directions, new curriculum models that allow for choice and learner flexibility are required. One approach that shows promise in this area is online problem-based learning (PBL). Traditionally, PBL provides opportunities to 'practice, use (and even develop) such processing skills such as problem solving, interpersonal, group and team skills, the ability to cope with change, lifetime or self-directed learning skills and self-assessment skills (Woods, 1996). PBL enables the learner to determine what topics will be explored, to what depth and which processes

will be used. This type of learning is supported by a skilled facilitator who adopts roles such as curator, facilitator, coach and challenger as required by the learner (Savin-Baden, 2007). PBL is well aligned with the call for an increased personalization of learning and learner choice in higher education and has been seen to provide that in the physically co-located setting (Hmelo-Silver, 2004). Extending PBL into the online environment builds on the affordances of the technology, has the potential for increased student and faculty engagement and, offers a means by which to address learner diversity. Incorporating this as an overall program design philosophy allows for the stimulation of critical thinking, the ability to address issues in depth, and the development of competencies required for living in a complex, information-based, technology driven society.

This case self study research examined the implementation of a problem-based learning pedagogical framework in the context of an online Bachelor's program offered at the University of Ontario Institute of Technology (UOIT). Through an examination of the experience of students, teaching assistants (TA), professors and the program director of the online BA program in Adult Education and Digital Technology (shortened to the AEDT program) attributes, affordances and role of synchronous technologies in fostering student and faculty engagement and creation of a learning community was also investigated.

BA AEDT Program Context

The AEDT program is offered completely online, with a mandatory real-time videoconferencing component and a problem-based learning pedagogical framework. In keeping with the need for access to knowledge age courses and programs, problem-based learning (PBL) is central to the design of the AEDT program and is defined as "a curriculum model designed around real life problems that are ill structured, open ended or ambiguous… PBL engages students in intriguing, real and relevant intellectual inquiry and allows them to learn from these life situations" (Fogarty, 1997, p.2). In each of the courses in the AEDT program students work in teams on a variety of problem scenarios or contexts that combine to make up a unit or section of the course. Students are expected to work collaboratively to initially identify or create a problem as presented in the situations or contexts and then subsequently to propose solutions to the problem using any and all synchronous and asynchronous tools available. "Synchronous collaboration tools are vital for the effective use of PBL online because tools such as chat, shared whiteboards, video conferencing and group browsing are central to ensuring collaboration with in the problem based learning team" (Savin-Baden, 2007, p. 23). As further described in the BA AEDT Course Development Model (2013), the PBL orientation of the program requires student exposure to video-based case studies or contexts in which problems can be identified for students to investigate as part of the course work. The activities, assignments and assessments in the course then become the vehicle for the creation of solutions to the problems identified from the case studies. Assessment tasks are authentic and focus on process rather than content (BA AEDT Course Development Model, 2013). The AEDT program intends to prepare a new kind of expert who is essential to the knowledge-based economy because

they possess a broad social understanding of adult education and a specialized knowledge and competency-base of the use of digital technologies for learning.

Each course in the AEDT program has used one or more aspects of the five models of problem-based learning outlined by Savin-Baden, (2000) as part of its design philosophy. In addition, the following PBL design principles inform every course in the program: 1) active learning; 2) integrated learning; 3) cumulative learning; 4) consistency in learning and, 5) learning for understanding (Engel, 1991). The AEDT program design philosophy (Figure 1) is informed by the Technology Competency and Use (TCU) framework, which "considers that a technology object serves as an interface between the user and: 1) other users, 2) stored information and 3) information processing tools or software" (Desjardins, 2014, para. 1) and the Community of Inquiry (COi) model (Garrison, Anderson and Archer, 2000).

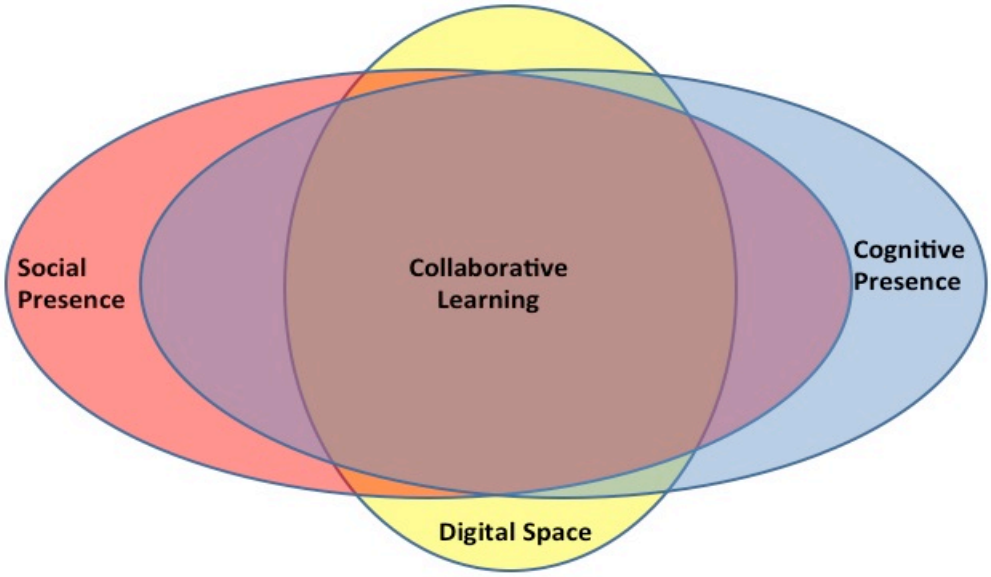

Figure 1: BA AEDT Program Design Model

The components of the BA AEDT program design model are defined as follows. Social presence is that which fosters the establishment and maintenance of a collegial, collaborative, and supportive environment in which students may freely and safely exchange and share their beliefs, views, and opinions. Cognitive presence is seen to promote the development of reflective practice and critical thinking. A cognitive presence encourages students to approach problems creatively; actively seek out sources of information; identify and address bias, prejudice, and privilege; manage, analyse and synthesize large quantities of information and, formulate and defend personal views and positions (Anderson 2007).

The digital environment is the digital space created by systems, structures, and processes that facilitate ubiquitous learning. The digital space also provides technological support and affordances for the development of tools and environments that enhance critical thinking, higher-order learning, and diverse communications. Collaborative learning in the BA AEDT program design model is defined as occurring in an environment in which the cognitive presence, social presence, and digital space intersect; an environment in which "members of a community of inquiry...construct meaning though sustained communication" (Anderson, 2007).

All of the aspects of the BA AEDT program design model allow for a diminution of the transactional distance between individuals within the community as all members, regardless of whether in the role of professor, TA or students, are able to see themselves as learners within the virtual space. To be sure, each member is learning different things but all are working together in a collaborative way, supporting and challenging as is appropriate to the circumstance. A typical 36 hour (3 credit) course in the AEDT program is articulated in 12 weekly modules that include: 1) video clips (2-3 per week; 8 – 10 min in length) and associated readings available online which outline the contexts and/or situations within which the problems can be identified; 2) online synchronous tutorials in Adobe Connect (60 minutes) moderated by a Teaching Assistant (TA) or instructor and drawing on the analysis and synthesis questions posed in the video clip as the starting point for discussion; 3) online discussions in Blackboard or other virtual tool; 4) PBL assignment and task work with a small team of students working collaboratively through a variety of online tools. The design philosophy used in the AEDT requires active student engagement in the learning experience.

As Conrad & Donaldson (2011) outline, student engagement is a collaborative process that is intentionally encouraged, evidenced by key elements and includes one or more of the following:

- Establishing their own learning goals
- Working together in groups
- Exploring appropriate resources to answer meaningful questions
- Completing tasks that are multidisciplinary and authentic, with connections to the real world
- Being assessed on an ongoing and performance based way
- Sharing work products with an audience beyond the classroom with the ability to add value outside the learning environment (p. 6)

The Canadian Education Association (CEA) studied student engagement in the K-12 sector and subsequently developed a framework to describe the forms of engagement – social, institutional, and intellectual. Of the three, fostering intellectual engagement is more challenging as it appears to contain two dimensions: 1) encouraging student rigor, relevance, interest, motivation and effort and, 2) creating instructional challenges which builds on Csikszentmihalyi's theory of *Flow* (CEA, n.d.) and supports many of the principles of PBL (Engel, 1991) and models of PBD (Savin-Baden, 2000).

The use of online communities as a vehicle by which to foster engagement is well documented in the literature (Luppicini, 2007; Palloff & Pratt, 1999). As identified by Lock (2007, p. 130) a community is "a process that is fluid in nature and "requires a highly interactive, loosely structured organization with tightly knit relations based on personal persuasion and interdependence" (Kowch & Schwier, 1997, p.2). The work done on communities of practice by Lave & Wenger (1991) and on online communities (Luppicini, 2007; Rheingold, 2012) focuses on moving individuals from the role of lurker to one of legitimate peripheral participation. Rheingold (2012) discusses how the quality of this collaborative participation can contribute to the creation of new knowledge in new ways.

In order to examine the role of the BA AEDT program design philosophy, including access methodologies, on facilitating online community, the SAMR model (Puentedura, 2003) was used as a framework for data analysis. Since SAMR focuses on the use of technology it was necessary to modify the definitions to focus on the use of the program. These modifications are outlined in Table 1.

Table 1: Current and Modified Definitions of the SAMR Tiers

	Current SAMR Model definitions		Modified SAMR Model definitions	
	Tier	Definition	Definition	Example
Transformation	Redefinition	Tech allows for the creation of new tasks, previously inconceivable	Program allows for the creation of new tasks, previously inconceivable	Use of student chosen social media tools and affordances for metacognitive tasks and procedural work in an open-ended, ill-structured context
	Modification	Tech allows for significant task redesign	Program allows for significant task redesign	Requiring students to access open educational resources (OER) for conceptual construction and solution building
Enhancement	Augmentation	Tech acts as a direct tool substitute with functional improvement	Program acts a direct tool substitute with functional improvement	The use of video-clips as contexts for the creation of problems instigating virtual AV discourse
	Substitution	Tech acts as a direct tool substitute with no functional change	Program acts as a direct tool substitute with no functional change	The use of break out rooms in Adobe Connect as direct tool substitute for break out groups in a physically co-located program.

Methodology

A case study method of inquiry was used in this research study as the phenomenon which is being investigated has multiple sources of evidence (Merriam, 1998, 2009; Yin, 1984) and occurred in a bounded system (Creswell, 2003). The research was conducted during spring semester 2014 and involved student (n=1), teaching assistants (n=2), new faculty (n=1), faculty member (n=1) and the program director (n=1). Data was collected in six focus group sessions of 90 minutes in duration conducted across four months using the synchronous tool used in the BA AEDT program, Adobe Connect.

Based on a review of the literature and the building from the TCU framework that underpins the BA AEDT program design philosophy, each focus group session was framed around an initial area for discussion. These included: (1) roles of stakeholders; (2) course access methodologies; (3) design philosophy; (4) faculty experience; (5) student experience; and, (6) future considerations. Data from the synchronous recording and the synchronous chat was transcribed and verified for accuracy of transcription by two research assistants. For this research study, data was initially themed and coded in nVivo by one researcher using the four main areas identified in the BA AEDT Program Design Model of (1) social presence; (2) cognitive presence; (3) digital space and, (4) collaborative learning as defined above. Secondary coding was done using the SAMR tiers of (1) redefinition, (2) modification, (3) augmentation and, (4) substitution (Puentedura, 2003) as adapted for the purposes of this study to the program level (Table 1). Collation of data sets from an additional three members of the research team and the associated member checking will be conducted in the next phase of this research.

Findings and Discussion

Table 2 depicts the intersection of the BA AEDT program design components and the modified SAMR tiers based on the initial coding and analysis completed.

Table 2: Frequency of intersection of BA AEDT program design components with SAMR tiers

	Substitution	Augmentation	Modification	Redefinition
Social Presence	6	11	11	6
Cognitive Presence	14	19	15	9
Digital Environment	5	6	10	4
Collaborative Learning	5	8	8	6

Lack of Distinction between Social Presence and Collaborative Learning

While the data appears relatively flat across the SAMR categories for collaborative learning with slightly more fluctuation in the social presence component, the initial analysis highlights a difficulty in distinguishing between social presence and collaborative learning. Difficulty in teasing apart the ability for members of a community to connect, collaborate and freely share their ideas, from the creation of sustained co-created community of inquiry, is evidenced by the following comment. This comment is indicative of both the creation of safe place to share ideas and the reliance on an ongoing dialogue within a community.

> *We've grown used to showing up to tutorials and being poked with question[s] and then we poke back with questions and then poke each other with questions and I think a lot of us really appreciate that environment, it allows us to think all over the place, to think in areas*

> *that we already have pieced together and when someone mentions something that we haven't quite pieced together...*
>
> (Participant, 2014).

This finding is not entirely surprising given that social presence underpins and supports collaborative learning as currently illustrated in the BA AEDT program model. Further examination of this finding will be useful in subsequent data analysis because of the implications it may have on student and faculty preparation for learning in this space as well as organizational support requirements.

Relatively high frequency of Cognitive Presence of the Redefinition Tier

In comparison to other BA AEDT model components, a relatively high frequency of instances of reflective practice and critical thinking being done in a significantly redesigned or new manner are present in the data where the modification and redefinition tiers intersect with cognitive presence. The data would appear to indicate a role for PBL in facilitating reflection and critical discourse.

> *"coming into PBL which was this other world that I didn't understand, there was a lot of fear, a lot of anxiety for a perfectionist like myself... it was stressful, I had to work really, really, really hard but ultimately it was that much more of a prize, of a reward when I got to the end. So the harder I had to push, the further I had to push, the more rewarding it was to get there and then I could see that process*"
>
> (Participant, 2014).

> "*having gone through an experience where there is so much authenticity in the creation of the final products and deliverables...figuring out things as we went along and it took me a lot longer than I thought it would"* (Participant, 2014).

As above, this finding will benefit from the collation of data from three additional sources and the associated member checking that will occur because of the implications on student and faculty support requirements.

Role of the Digital Environment

Due to the nature of the BA AEDT course assessment methodologies, it was anticipated that the digital environment component of the program design model would feature prominently in the data however, that does not appear to be the case. The data would appear to suggest that is in part due to the broad digital environment used in the program. As one participant states, "you don't have to stay within the LMS, you can have a Weebly site, you can have.... whatever you want to point people to" (Participant, 2014). In addition, there appears to be a supporting role that the digital environment plays in the co-creation of community as evidenced by the following observation.

> *"think[ing] back to the very first group coming through around the technology because it was so frustrating for many and there were so many different types of technology (WebKF, Dropbox, Skype, Adobe*

Connect, UOIT email)... a real community started form just around "can you help me figure this out" (Participant, 2014).

Summary

The very nature of the continuum of PBL used in the BA AEDT program as part of the program design philosophy requires that the learning environment created in the program be collaborative. What is interesting in the initial data analysis is that in the co-creation of this learning environment there is evidence of enhancement (augmentation tier) and transformation (modification and redefinition tiers) across all components of the BA AEDT program model. The BA AEDT program model, affordances of technology and use of various course access methodologies initially appear to allow for a redefinition and transformation of ways in which participants conceive of creating and interacting with the resulting online community.

With an eye to future research in this topic area, this research team is embarking on a detailed study of online community development, as it currently exists within the BA AEDT program and in other forums. Plans are in place to completing a far more detailed analysis of the present data set and the team is working on a project that will attempt to identify the essential characteristics that are required for an online community to become and remain viable. In addition, another set of projects is underway to look at the interaction effects of PBL and technology competencies. It is conjectured that all of these studies will allow for greater insight regarding what membership within an online learning community entails and how individuals within these communities can make use of the digital affordances that make up the online environment.

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