INTEGRATION OF PBL METHODOLOGIES INTO ONLINE LEARNING COURSES AND PROGRAMS

Roland van Oostveen, PhD; Elizabeth Childs, PhD; Kathleen Flynn and Jessica Clarkson
Faculty of Education, University of Ontario Institute of Technology

ABSTRACT

Problem-based learning (PBL) challenges traditional views of teaching and learning as the learner determines, to a large extent with support from a skilled facilitator, what topics will be explored, to what depth and which processes will be used. This paper presents the implementation of problem-based learning methodologies in an online Bachelor's program in adult education and digital technology. The processes of PBL in the online environment and the subsequent roles of learners, teaching assistants and instructors in the co-construction of the learning environment are examined. Implications for the institution and other research underway are discussed.

KEYWORDS

Problem based learning, online program, adult education, digital technologies

1. THE BA AEDT PROGRAM CONTEXT

1.1 BA AEDT Program Description

The Bachelor of Arts (BA) in Adult Education and Digital Technology (AEDT) program recognizes the growing importance of formal and informal lifelong learning as seen in the expanding professional development needs of post-secondary instructors. Similar requirements are apparent in corporate, community-based, professional and public sector workplaces. As the instructional demands of these large institutions and organizations continue to grow outside the traditional university and college-based education system, and as human resources departments turn their attention to the economic benefits of just-in-time online learning opportunities, there is an increased need for individuals with the knowledge, competencies and skills associated with teaching and learning in adult education environments in the digital age. 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. Current students in the AEDT program represent early – mid career adult learners who are working full time in higher education, healthcare, finance, government and manufacturing sectors.

The AEDT program is designed for advanced entry by those with a post-secondary diploma. A typical 36 hour (3 credit) course in the AEDT program is articulated in 12 weekly modules that include: (1) a collection of curated online resources comprised of a combination of 3 - 5 video clips of 5 – 10 minutes in duration and associated online readings which outline the contexts and/or situations within which problems can be identified; (2) online synchronous tutorials in Adobe Connect that are 60 minutes in duration. These are moderated by a Teaching Assistant (TA) and/or the course instructor and draw upon the analysis and synthesis questions posed in the video clip as the starting point for discussion; (3) online discussions in Blackboard or other asynchronous tools; and, (4) independent and group work on problem based learning (PBL) tasks as defined and negotiated by their collaborative teams. The 2014-2015 academic year represents Year Two for intake into the AEDT program. There are currently approximately 50 full time AEDT students with over 100+ students from other university faculties choosing to take one or more AEDT courses as electives.

1.2 AEDT Program Structure

In keeping with the need for access to information 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 or learners are working in teams on a variety of problem scenarios or contexts that combine to make up a unit or section of the course. Learners 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 (Savin-Baden, 2007).

As further described in the AEDT Course Development Model (vanOostveen, 2013a), the PBL orientation of the program requires the setting of a context in which problems can be identified for students to investigate as part of the course work. Typically 2-4 PBL modules varying in length from 1 session to 4 or 5 weeks are incorporated into each course (Savin-Baden, 2007). The activities, assignment and assessments in the course then become the vehicle for the creation of solutions to the problems. Assessment tasks are authentic and focused on process rather than content (vanOostveen, 2013b). Each course in the AEDT program has used one or more aspects of several 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 (Engel, 1991) inform every course in the program: 1) active learning; 2) integrated learning; 3) cumulative learning; 4) consistency in learning and, 5) learning for understanding.

The AEDT program design philosophy is informed by the Technology Competency and Use (TCU) framework which builds from a Community of Inquiry (COi) model (Garrison, Anderson and Archer, 2000) and "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). The TCU framework identifies four orders of technological competencies (technical, social, informational and epistemological) which are examined through the TCU survey instrument. The TCU survey has been used "to collect data in a variety of higher education settings and work is progressing on the analysis to explore trends in use as well as the associated competency and skill development" (Desjardins, 2014, para. 1).

1.3 AEDT Program Facilitators

Program instructors are drawn from the faculty ranks and augmented with sessional staff. There are also numerous teaching assistants working in the AEDT courses, all of whom are current graduate students in the Faculty of Education. The online pedagogical structure that underpins the AEDT program postulates that students, instructors and teaching assistants should be viewed as learners in the learning community that is instituted, each with equal standing from a power perspective but with different goals and responsibilities. Some of these learners (instructors and teaching assistants) primarily function as facilitators, stepping in to scaffold and support the community. While each facilitator diverges in different areas of content knowledge, each is committed to high standards of professionalism and aiding to the growth and expansion of knowledge for AEDT program learning community. Facilitators are required to possess and employ characteristics such as: empathy, intuitive awareness, introspection, and analytical skills. These combined with a collaborative team mentality appear to foster an effective online PBL environment (Hmelo-Silver, 2004; Hmelo-Silver, Duncan, & Chinn, 2007; Savin-Baden, 2007).

Facilitators who have personally experienced the processes of PBL generate integrity as they tend to be genuinely empathetic towards students and show high levels of affective support to nurture learners (De Grave, Dolmans, van der Vleuten, 1999), leading to the establishment of stronger relationships. Facilitators in the AEDT program who display a genuine interest in learning collaboratively as a team with the other learners, remove the power dynamic from their role and instead integrate into the community of learners as equals. Facilitators can then model and encourage introspection and analytical skills with others and foster engagement in the co-creation of knowledge. Facilitators essentially become cognitive apprentices by modeling reflection, questioning strategies and critical thinking (Collins, Brown, Newman, 1989). Effective online PBL facilitators must also display an intuitive awareness (Hmelo-Silver, Duncan, & Chinn, 2007) when guiding others in the construction and integration of knowledge (De Grave, Dolmans, van der Vleuten,

1999). Expert facilitators who exhibit an instinctive awareness of each learner's zone of proximal development (ZDP) and observe learners' non-verbal or subtle cues challenge learners in a non-aggressive manner (Vygotsky, 1978). Therefore facilitators who integrate themselves as a member in the community of learners build robust relationships that allow all learners involved to prosper in the PBLO environment.

The AEDT students, as equal members in the online learning community, also play an important role in the facilitation processes of PBL. As co-constructers of knowledge, the students need to be motivated intrinsically, communicate their conjectures with openness to constructive criticism and show perseverance with the desire to learn outweighing the discomfort that accompanies PBL (Hmelo-Silver, Duncan, & Chinn, 2007). As students move away from extrinsic motivation of grades, towards an actual desire to grow and expand their knowledge, this shift empowers learners to take responsibility and cognitively engage in their learning (Mayer, 2004). Once they have accepted their responsibility within the community they begin intellectual play with other members by communicating and defending their ideas, thoughts and conjectures and scaffolding other learners ideas through rebuttal and questioning (Puntambekar & Kolodner, 2006). In the AEDT program the process of experiencing PBL initially can accompany feelings of frustration for each member of the learning community as learners adjust to the new freedom afforded to them when the walls and constraints of traditional learning have been removed. Learners within the community (students, instructors and teaching assistants) need to embrace this cognitive dissonance in order to experience a critically reflective "aha" moment (Bencze, 2014). Habermas (1971) explains this reflective moment as the knowledge experienced that leads to a transformed consciousness. It is during this moment that the learner may ultimately emancipates their entrenched constructs of traditional learning while both recognizing and accepting the new liberties and boundless options possible. In the AEDT program it is usually after this "aha" moment when all learners in the community may arrive to a deeper understanding of the processes of PBL and the roles and responsibilities of each member in the community.

2. PBL USAGE IN THE AEDT PROGRAM

2.1 What is PBL?

PBL tends to challenge traditional views of teaching and learning since PBL, in essence, takes control of learning processes out of the hands of the teacher/expert and places it squarely on the shoulders of the learner. The learner determines, to a large extent with support from a skilled facilitator, what topics will be explored, to what depth and which processes will be used. Working from a video based case study which presents a real life context (Fogarty, 1997), learners create a problem or a set of problems which will become the basis of subsequent inquiries. PBL is organized around the contexts from which problems are drawn. The contexts then must be relevant and authentic in order to provide links that the learners use to make connections to their own experiences and interests (Hmelo-Silver, Duncan & Chinn, 2007).

A wide variety of problem orientations are used within the AEDT program. 'Given' problems, using the phraseology of Watts (1991), proceed from tightly constrained contexts within which the goal or desired situation and the strategies to be used are provided to the learner. Given problems are viewed in similar ways to Savin-Baden's (2000) Model I scenario. Learners operating in these scenarios are expected to apply predefined information to the differential between the current situation and the desired situation (S_D-$S_{C)}$ and in so doing produce a solution to the 'problem'. The emphasis is on 'how to' rather than constructing new understandings or knowledge. Another way to conceptualize these scenarios would be to view them as 'projects' with a focus on the application of concepts to the focussed issue or 'problem'. At the other end of the continuum, constraint-free, 'blue-sky' type problems are also represented in a number of courses in the AEDT program. Watts (1991) talks about these as 'own' problems or problems in which neither the goal/desired situations nor the processes to be used to reach the desired situations are provided. These aspects are then left to the learners to determine and decide. Savin-Baden's (2000) Model V scenarios are similar in that they are characterised by providing learners with occasions to develop their own learning autonomy including "multiple models of action, knowledge, reasoning and reflection, along with opportunities for the students to challenge, evaluate and interrogate them. Students will therefore examine the underlying structures and belief systems implicit within a discipline or profession itself, in to not only understand the disciplinary area but also its credence" (p. 133). For example, when issues such as the juxtaposition of

technological and sociological determinism when effecting tool choice and use is considered, students must be given opportunities to explore the implications for their own lives as well as for society at large. It is important for educators to be able to anticipate the beneficial and detrimental effects of a particular technology on students and for educators to determine how student groups will react to certain technological tools and affordances.

2.2 Strategies used in the AEDT Program

The PBL continuum manifests itself regardless of the type, complexity or features of the situations that are represented in the AEDT program. Contexts are presented in the form of publically (Creative Commons Attribution Licenced) available YouTube video clips. YouTube was chosen as the platform of choice due to its easy to use features, as well as its relative reach in that it seems to be ubiquitously accessible through an Internet connection from anywhere in the world. Each of the clips was purposefully created by instructional developers and in ways that are designed to be viewed by individual learners prior to coming together to discuss the created problems. Discussions between and among learners about the problems are conducted as tutorial sessions that are held in browser based virtual audio/video conferencing rooms. During these sessions learner work groups are initially established around similar problems. The learners then proceed to clarify the problem setting, gather the knowledge and resources that will be required to work towards creating solutions. The instructor and/or teaching assistant (TA) facilitates the collaborative discourse by interposing questions that are designed to serve as scaffolded supports enabling the learners to remain within their zone of proximal development (Hmelo-Silver, Duncan & Chinn 2007; Vygotsky 1978).

A third venue for interaction within the AEDT programs is centred on tasks and assignments which the learners undertake. Typically learners collaborate on these tasks and assignments within small groups of 3 or 4. The work itself is done using a vast array of mostly open access/source tools that are currently available. This is provides freedom of choice for adult learners rather than confining them to work specifically within the constraints of closed systems such as a learning management system (LMS). The only stipulation that is placed on the choice of tools is that it needs to be sharable with the rest of the class and the location of the work be known by providing the URL. The tools used include: Skype, Google Drive, Prezi, TodaysMeet, Blogger, etc. In most courses, learners will be asked to post regular metacognitive reflections and progress reports in some type of discussion board.

Since each of the courses in the AEDT program may use different definitions or models of PBL, the types of activities in which learners are engaged will also vary. In some courses, learners will engage ‘in explorations and analyses of data’, activities that are reminiscent of scientific investigations or inquiry learning and in others they will identify problems and ‘consult various resources to solve them’ (Hmelo-Silver, Duncan & Chinn 2007, p. 100) using processes that are very much PBL oriented. Therefore, for the purposes of the AEDT program, it is assumed that PBL and Inquiry Learning (IL) are similar as both require learners to collaboratively participate in ‘sense making, developing evidence-based explanations, and communicating their ideas (Hmelo-Silver, Duncan & Chinn 2007, p. 100). Frequently in IL, learners will be required to pose questions, collect data and then to test hypotheses or conjectures regarding answers to the questions.

3. IMPLICATIONS

3.1 Redefining HE Degree Pathways

By definition the AEDT program is situated to take advantage of the current interest in leveraging the potential of digital technology affordances in adult education contexts. It does this by providing alternatives for employment opportunities outside the Kindergarten to Grade 12 education system and capitalizes on the recent success of pathway programs, allowing qualified students with a college diploma to receive a university degree, while simultaneously decreasing the time required for completion. The AEDT program affords careers in HR management and training in the industrial, commercial and various other sectors by offering adult educators opportunities for professional development and advancement in adult education and human resource development.

With the course content numerous opportunities are presented to investigate the juxtaposition of prevalent but competing concepts, such as technological and sociological determinism. In addition, PBL allows for cognitive transformations, such as those described above, as learners explore adult education and the influence of digital technologies. Many of these transformations may be seen through a variety of theoretical lenses, such as the Puentedura's (2003) SAMR Model.

3.2 Institutional Implications

In addition to the individual transformations that occurred as a result of the implementation of PBL in online environments, a wide variety of key institutional requirements which are necessary to support this type of program emerged from the development of the AEDT program. Work done by vanOostveen, Partosoedarso & Robertson (2013) identified nine areas requiring attention at the institutional level in order for the AEDT program to be supported in a manner that could be considered comparable with competing programs. These include: (1) promoting effective communication about online programs within the institution; (2) determining a fee structure that respects online learners and the institutional needs; (3) enhancing online student life; (4) creating online orientation sessions; (5) creating online practice and learning communities; (6) providing access to formal administrative functions such as the registrar's office and program administration; (7) promoting the program and recruitment of learners; (8) increasing faculty flexibility and capacity through transformed understandings of pedagogy and learning; and, (9) developing and implementing specific online course and program evaluation processes. For an institution that is working to further establish its online presence, the ability for the AEDT program to help to elucidate areas requiring further attention has been critical to both the success of the program and the expansion of online offerings at the institution.

In addition, work is currently underway that builds on the initial experiences of the AEDT program and the TCU instrument itself, to examine the differential in what Watts (1991) would deem "given" and "own" and Savin-Baden (2007) would deem as "Level V PBL" performance assignments and personal profiles generated by the TCU instrument. The outcomes of this research will aid in the further refinement of the AEDT thesis exit courses and lay the preliminary groundwork for two larger research studies focused on the experience of program and elective students respectively in the AEDT online synchronous PBL learning experience. Taken together, these research projects and institutional implications have the potential to further the understanding of the intellectual, social and academic engagement of students in online synchronous courses and the supports required for them to be successful.

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