Adaptation, Resistance and Access to Instructional Technologies: Assessing Future Trends in Education

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Chapter 7
Design and Development of Personalized Learning Environments

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ABSTRACT

This chapter describes a pedagogical approach to engage students in online learning environments, using XNAMEX Becta’s model for personalized learning and student engagement (PLEaSE). PLEaSE maximizes learning outcomes by supporting students at times and in places that are appropriate to their needs and in ways that suit their personal dispositions. In this study, students are encouraged to explore, develop, reflect, and construct their own knowledge and create their own learning content, while the instructor plays the role of coach and facilitator. This study is part of an ongoing action research project on the Scholarship of Teaching and Learning (SoTL) in Higher Education, whose purpose is to design and develop the Pedagogy of Engagement Integrating Technology (PoEIT) model. PoEIT engages learners in the use of online tools such as forums and blogs while developing their soft skills using Moodle platform. This study shows that with the right integration of pedagogy and technology students can be transformed to become independent learners.

INTRODUCTION

Preparation of students for the 21st century requires changes in curriculum and pedagogy. Preparation is to ensure that students are ready and able to meet the Malaysian Qualification Standard (MQS) and similar standards as set by the National Educational Technology Standards for Students. The categories of skills (ISTE, 2007) required by the students in this preparation are listed as follows: (1) creativity and innovation; (2) communication and collaboration; (3) research and information retrieval; (4) critical thinking, problem solving, and decision making; (5) digital citizenship; and (6) technology operations and concepts.

The onus is on teachers and instructors to interest students in researching for creative strategies. More collaborative techniques and innovative
technologies are required to engage students with 21st century skills. Students can only be trained through a total immersion in a technology-based learning environment, while solving real problems, using new tools to reflect, to develop content and to engage in social interactions. The emphasis is on the skills and knowledge required by students to learn and live productively in a digital society, and on creativity and innovation in technology.

Technology allows students to personalize their learning. Personalized learning has the purpose of encouraging students to become more involved in making decisions about what and how they want to learn (Campbell, et al., 2007). According to Leadbeater (cited in Campbell, et al. 2007) personalization is a socially oriented idea which could operate at five deeply structured levels:

1. Providing more customer friendly services
2. Giving people more say in navigating their way through services
3. Giving users more say over how money is spent
4. Users becoming co-designers and co-producers of services
5. Self-organization by individuals working with the support and advisory systems provided by professionals

Leadbeater (2003) believes that personalized learning is the promotion of self-realization, with students construed as active and responsible co-authors of their educational scripts. This will result in deep learning whereby students set their own learning targets, adopt continuous self-assessment for learning and develop the flexibility in learning beyond the classrooms. In this environment the technology tools such as Moodle allow for continual support by the professionals (instructors and tutors) and an advisory system to take place anytime and anyplace. Moodle as a learning management system (LMS) enables the students to navigate the learning journey while developing various skills in self-organization and life-long learning.

**TRANSFORMING TO PLEaSE**

Personalized learning requires redesigning of courses to allow for active and reflective learning to take place. In this chapter the author shares her experience in transforming her teaching in an undergraduate course for teacher trainees. It involves a reexamination of her beliefs and approach to teaching and learning in a technology-based learning environment. She believes that to learn about ICT, students should be immersed in ICT where learning is face to face and further supported online. The objectives of the Personalized Learning and Student Engagement (PLEaSE) are to: (1) engage learners in active learning; (2) encourage learners in collaborative and critical learning; (3) reinforce the development of soft skills; (4) facilitate construction of learners’ own knowledge; and (5) explore projects based on the real-world environment.

Personalized learning can develop independence in students. Students learn to be co-producers and managers of their learning. Managing learning involves managing the given tasks related to course projects, managing the content of what they are learning, and managing the peers who are co-producers and co-learners in the team. In PLEaSE, students can co-author their educational scripts, thus allowing for individual interpretations of goals and values of education. As an innovation, personalized learning environment is a change that has to be managed. Transforming the traditional learning environment to a personalized learning environment requires scaffolding from the instructors who can provide guidance through mature thinking, patience and intentional support.
BACKGROUND

The course under examination is the Technology for Primary Education course. This course is an introduction to technology based learning for the teacher trainees. It is compulsory for third year bachelor of education students to pass the course. In the last cohort there were 73 students ranging between 21 to 22 years old. A survey of students’ prior ICT skills was conducted on the first day of class to ascertain their readiness to learn in a technology-based learning environment. These students were found to be familiar with the latest ICT tools, and the majority owned a mobile phone (some with 3G capability), mobile broadband and some owned laptops which they carried to class. Most students were familiar with social networking tools and were subscribers to Friendsters, MySpace, Facebook and Blogs.

ENGAGING STUDENTS

The course was designed to introduce the students to ICT tools, ICT pedagogy and how to create learning environments where technology facilitates the student learning. Students were also introduced to the concept of personalized learning and student engagement (PLEaSE) (see Figure 1). This requires modeling of pedagogical change by the instructor and tutors. According to Bowen (2005) engaging students involves “getting students to engage and actively participate in their learning process; to engage with the object of study (ICT in primary education); to engage with the context of the study (primary education); and to engage with the human condition (learning how to interact in a social environment).”

David Merrills’ First Principles (2002) guided the author in the design of strategies to engage students through project-oriented problem based learning (PoPBL) activities which require team-

Figure 1. Elements of personalized learning and students’ engagement (PLEaSE)
work, collaborative learning, problem solving, creative thinking and research. According to Merrill, learning is facilitated when learners are engaged in solving real world problems; when existing knowledge is activated; and when new knowledge is demonstrated as well as applied by the learners and finally integrated into the learner’s world.

The process of inquiry and inductive learning built into the PoPBL activities was based on the principles of engagement theory, a framework for technology-based learning and teaching as proposed by Kearsley & Schneiderman (1999). Engagement theory is based upon the idea of creating successful collaborative teams that work on ambitious projects that are meaningful to people outside the classroom. In this case the project was for the teams to develop learning resources using SMART notebook software for primary school teachers to use with Interactive White Boards (IWB). The three components of engagement theory (which is summarized in the Relate-Create-Donate strategy) imply that learning activities occur in a group context, are project-based and have an outside focus (Kearsley & Schneiderman, 1999):

- **Relate**: students work in teams or collaboratively
- **Create**: students work on authentic projects that are meaningful to them
- **Donate**: students share their finished projects with a larger audience outside the classroom

Technology was used in all the individual and group activities pertaining to relate-create-donate strategy which allowed the teacher trainees to experience technology as a professional tool and as a culture. The ICT pedagogy allowed them to examine the roles of the teacher and students. They were able to see and experience how ICT could be used by a teacher to assess learners’ prior knowledge, to provide mastery learning through coaching, mentoring and scaffolding processes and to assess individual and group learning.

The class met face-to-face once a week for three hours for 14 weeks. A virtual learning environment was created on a learning management system to support student learning outside of the classroom hours, to engage them with the technology-based learning environment and to provide them with a personalized learning environment. The learning environment provided students with the content and resources, activities and opportunities for reflection and articulation and the necessary learner support to guide learners as well as give them assistance and feedback during learning (Oliver, 1999). As part of the course orientation, students were introduced to the virtual learning environment and the learning management system (LMS) so that they would become familiar with the new learning environment, the tools and the available resources.

### The Learning Management System (LMS)

The virtual classroom was managed using the learning management system, Moodle. The technology enhanced the support provided by the lecturer and the tutors outside of the class time. Moodle, an open source LMS was relatively easy to use and the students, because of their past experience with social networking software had minimum problems navigating through Moodle. The virtual classroom concept was adopted where access to the course was made available 24/7, and support from the instructor and tutors were made available and not limited to face to face meeting. For the students, this course was their first experience in online learning. The transformation, from face to face classroom which they were familiar with to a blended classroom, went quite smoothly. Most students embraced the change quickly. A few needed much prodding and convincing from the instructor, tutors and their peers to be more motivated to move onboard. The first couple of
weeks saw peer mentoring and coaching happening face-to-face and online.

During the three-hour weekly class meetings, the first hour was often used for activation of prior learning followed by lecture and demonstration. The subsequent two hours were used to involve students through group discussions and practice sessions. Two computer labs were utilized to ensure that each student had access to a computer for at least two hours a week during the class time. The students used the computers and some used their own laptops to conduct research and to complete the tasks related to the course during the two hours.

**Relating: Working in Teams or Collaboratively**

Project oriented problem based learning (PoPBL) was used in the completion of the class’s final project. PoPBL enables students to collaborate, to learn and to stretch their thinking (Bean, 2001). The final assignment required students to work in groups of 4 individuals to develop instructional materials for use with the Interactive White Boards (IWB). Each group had to develop materials for English, Math and Science lessons. The final project helped the students to learn about Interactive White Board as a tool to engage learners in whole classroom interaction and at the same time developed instructional design competencies. The instructional design employed the objectivist-constructivist blended design approach (Chen, 2007) whereby constructivist design has the strength to promote meaningful learning whereas objectivist design has the advantage to produce efficient learning. Thus the technology supported PoPBL project approach allowed for the development of meaningful and efficient learning.

It was a challenge for the students to learn to use the IWB tool and the software to develop the content in just five weeks. The software was downloaded by the students into their own personal computers or laptops, which they used outside the class time, mostly at home. The project development was monitored closely by the instructor and tutors. The group reported weekly for four weeks on their progress during the face-to-face class meetings. The final products were showcased to the whole class. The IWB products were uploaded to Airset.com, a tool for collaboration which was taught to the students during the class. By uploading their final projects to Airset.com, students donated their products for use by other teachers.

**Creating and Donating: Authentic Meaningful Projects**

Students experienced knowledge construction activities where sharing and generating ideas became a habit. Their forum space in Moodle became a teaching and learning classroom, where students posted questions and ideas that were of concern to them. The forum topics were mostly triggered by issues discussed in the class, or stories told by the instructor, questions to ponder and readings and links posted online by both the instructor and the students. The interactions created a learning community. Twenty-eight new forum titles were created by the students in fourteen weeks. One forum was created by a student after the semester was over to discuss a topic from another class in the subsequent semester. The forum space was a reflection of what the teacher trainees were concerned about. Such topics as ICT use in primary schools and the roles of teachers were popular (Figure 2).

Issues such as lack of infrastructure and ICT facilities in schools reflected the concern that the teacher trainees had in relation to their future posting as teachers. Higher order thinking was observed to have been employed in the forum where students created contents from knowledge that they researched on the Internet and from their personal experiences. On many occasions peer-teaching and mentoring took place in the online classroom as evidenced in the discussion in Figure 3. The learning environment had contributed
to the creation of self-directed learners (Hartley & Bendixen, 2001) who were able to regulate, guide and direct their learning. Self-directed learning was also evident in the weblogging activity that each student had to conduct as a course requirement.

**Weblogging and Reflective Learning**

Learning by reflection was utilized in the course to allow students to engage in knowledge creation and to explore the connections between course materials and their individual life or psyche (Bean, 2001). Reflection was enabled via weblogging. Weblogging on Blogspot was a graded course requirement. Criteria for grading the blogs were agreed with the students at the beginning of the course. It was a common understanding that the blog was an academic exercise and students were to use good English to write and present their ideas. Each student created a blog on the first day of class. A minimum of 10 postings were required over a period of 14 weeks. Students were required to blog and reflect on their lessons and readings, at least once a week. They were instructed to start reflecting by thinking about “Today I learn, today I question.” Their blogs were closely monitored by the teaching team. New blog entries were fed to the teaching team through bloglines.

Students posted their blog links as their personal website in their profile on the class Moodle. Students were also encouraged to visit their friends’ blogs and leave comments. Blogging helped the students to personalize their content...
knowledge, based on what they had learned and understood. Some students used the opportunity to read and search for more information which they were certain could benefit their friends by enriching their blogs with links and ideas. Some even provided tutorials on specific skills and knowledge to benefit the peers. For most students this was the first time that they blogged for academic purposes. It took a while to convince everyone to share their thoughts with and communicate what they have learnt to others. Good blogs were shared with the class thus encouraging others to benchmark their work. Benchmarking helped the students to keep track of their learning and to improve their work by accessing their peers’ reflections.

**Soft Skills Acquisition**

Besides preparing student teachers with the pedagogy to engage learners in technology-based learning environments, lecturers and tutors were also responsible for making sure that future teachers would be adequately equipped with the necessary soft skills which are:

1. Creative and critical thinking;
2. Communication;
3. Life long learning;
4. Team work;
5. Leadership;
6. Ethics and professional values; and
7. Entrepreneurship

Such skills are also known as generic skills. Year 2007 was the first time that the public universities in Malaysia had to assess their students’ acquisition of soft skills during their third year of study. Soft skills were embedded into the teaching and learning activities and were assessed formally. In this course students were given orientation on the need to assess their soft skills as one of the learning outcomes, on the first day of class.

Figure 3. A threaded discussion started by a student
Self-assessment of soft skills was encouraged. To find out if students were able to assess their soft skills, a message was posted by the instructor that told students to assess their soft skills and to give evidence to show that their soft skills had improved. Thirty-nine (53%) students responded to the message. The responses were mostly positive and lengthy. Students indicated that they had developed the soft skills and were able to give evidence to show that they were able to assess their learning and the course had helped them to achieve learning outcomes related to soft skills. Here is an example of the response:

Re: MY Soft Skills acquisition

by Student #1 - Wednesday, 3 October 2007, 11:38 AM

As far as I’m concerned, I’ve developed most of my soft skills since entering this course. For instance

1. **Communication:** Before this I’ve always worked with the same group members but luckily for this course I’ve a chance to work with new group member (INA) who is from the same course (B.Ed TESL). I had the opportunity to communicate and work with her. Besides that, blogging also developed my communication skills as I’m able to communicate my ideas and also tighten our friendship.

2. **Creative and critical thinking:** Undeniably, this course requires me to work on a few projects and activities such as web-based learning, IWB assignment, designing posters, etc. So, I’ve to utilize creative and critical thinking skills in order to produce high-quality products. Moreover, blogging and forum also developed my reasoning skill in discussing and responding to the topics or issues raised. (Thanks for providing wide intellectual exploration!!!)

3. **Team work:** most of the work assigned need to be accomplished in group. As a result, I find that I’ve also developed skills of working in a clique of friends as I believe that more heads are better than one and also create synergy. It also teaches me how to cooperate with others when doing particular work esprit de corp!

4. **Leadership:** in my group, we never appointed a group leader as I believe that everyone is a leader. Each of us has responsibility to lead and guide ourselves. But, in completing certain tasks, I volunteered myself to plan and divide the work among us. I feel quite proud as my leadership skills can be developed and I do hope to further hone this skill in the future.

5. **Ethics and professional values:** of course as teachers-to-be, we should equip and practice the ethics and professional values. Some of the values which I think I’ve developed are we should give serious commitment when completing particular tasks, never practice procrastination and be open-minded.

6. **Entrepreneurship:** I think this is one of the soft skills which I still lack. So, I need to be more active and seek for opportunities.

7. **Lifelong learning:** this course has made me aware of the importance of life-long learning specifically in the educational field. In this 21st century, there is a rapid and tremendous development of technology and it also enormously influenced the use of ICT tools in classroom. Thus, as teachers in the technology explosion era, we need to learn, learn and learn so as to equip ourselves with sound knowledge especially about the educational technology.

**Transformation**

From the blogs and the discussions in the forums, students were observed to have transformed from novice users of technology to practitioners.
who were engaged and immersed in the use of technology and at the same time they learned to sharpen their soft skills. The learning outcomes for the projects were achieved whereby students were able to develop the products, in the form of IWB courseware, which necessitated learning of new tools, message design, instructional design, project management, social networking tools and the learning management systems. Besides achieving the planned learning outcomes the students also displayed outcomes related to peer mentoring, coaching and benchmarking that were not planned for in the course syllabus. From the forums and personal testimony, it is evidenced that these future teachers have been empowered with their newly acquired technology skills and soft skills giving them the confidence to engage their future students in technology.

**CONCLUSION**

As a world of “one size fits” all gives way to a world of personalisation, education would need to make adjustments to survive (Heppell, 2008). This chapter is an attempt to share the author’s experience of training undergraduate teacher trainees to embrace technology in teaching and learning and to prepare them for such a world of personalization through the practice of personalized learning and student engagement (PLEaSE). By modelling the pedagogy for use of ICT in teaching and learning, teacher trainees were immersed in the technology-based learning environment. Through PoPBL they were empowered with tools and techniques to solve real world problems. Teacher trainees were provided with opportunities to personalize learning, to reflect on their journey individually and in groups, to learn face-to-face and online. They used Web 2.0 tools to communicate, collaborate, socialize and manage their learning. Learning transformation was observed from the quality of interactions in the course forums, weblogs and the products submitted at the end of the semester.

This experience is also an attempt to explore the scholarship of teaching and learning (SoTL) in a scholarly teaching practice to develop the Pedagogy of Engagement Integrating Technology (PoEIT) model (Raja Hussain, 2006) where technology is integrated into the teaching and learning, making the pedagogy more interesting and challenging. The sharing of the scholarly practice is also meant to be a form of reflection on the teaching and learning practiced in the technology enhanced learning environments. Thus making the teaching public, open to critique and evaluation from others so that the community can build on this work (Hutchings and Shulman, 1999).

In the personalized learning environment students could learn through reflection, knowledge construction and social interaction which are lifelong learning skills. In order to train teachers who are ready for the 21st century the instructor has to be able to: 1) please students, have faith in them and support their learning through coaching and mentoring; 2) model the philosophy, the use of the strategies and the use of the supporting technology; 3) engage students in learning through careful instructional design and development, taking into consideration students readiness, prior ICT skills, time management and appropriate reward system; and 4) support online learning through scaffolding, regular feedback and monitoring of student learning.

**REFERENCES**


