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Mobile Learning for Higher Education in Problem-Based Learning Environment

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Abstract: This paper describes the PhD project on Mobile Learning for Higher Education in Problem-Based Learning Environment which aims to understand how students gain benefit from using mobile devices in the aspect of project work collaboration. It demonstrates research questions, theoretical perspective, research methodology, and current progression.

Keywords: Mobile Learning, problem-based learning, personal learning environment

Introduction

The research aim to investigate what is benefit which students as learners can get from mobile learning in Problem Based Learning (PBL) environment. Research question is "How mobile technologies can increase the quality of collaboration and group work in Problem-Based Learning environment?" Furthermore the research project will address these questions.

- How do student use technologies to support their collaboration and how can mobile technology be used to enhance the collaboration in project?
- What are the benefits students can get from mobile learning in Problem-Based Learning environment?
- How do mobile technologies change the way of students' learning and collaboration?

1. Context and Background

We started using web as resource of information and for marketing purpose. Virtual Learning Environment (VLE) was being used among many institutes in early 2000s. It is used as a communication channel between instructors and learners. It has become a virtual space which instructors and learners can share, exchange, discuss, do exercise, and even evaluate. Anyway there were a few researches focus on learners' perspective. Currently, learners have more resources available for them to access, as promise by web 2.0 they have their own communities to share experience and for both formal and informal learning. Young people, if they are interested they can learn from the Internet individually or by joining a community. Therefore, now we are moving forward to a research paradigm about personal learning environment (PLE) which focuses on how learners, they build up an environment (timing, space, tools, accessibility, and social) that they are comfortable. Every learners may have different learning environments depends on various factors, such as personal characteristics, cohort culture, available time for learning, extrinsic and intrinsic motivations, technology using and their affordances, social and personal properties, and pedagogy which is set by their instructor. ICT has made new space for learners. Learning is

not only limited by physical space: formal space (e.g. classroom), social space (e.g. canteen, café), transition space (e.g. hall way), small group work space (e.g. project room, library), private (house). Learning can be leverage via virtual space – social (e.g. social network), formal and informal public communication (e.g. VLE, blog), and private (e.g. email, chat) [1]. Collis and Moonen (2010) [1] have found that twenty-first century learners different from the previous generation of learners. Twenty-first century learners make use of digital learning activities which relate to their personal learning organization to access, linkage, and share. This is a new phenomenon because their sharing influences to their learning resources. They put their ideas, thoughts, and any kind of reflection on resources. The reflections are noticed by other learners and even by the learning-resource creator. Later on, it influences the resources, for instance, changing the content in the resources.

In order to increase the level of personal context, mobile devices which are considered as personal devices take place. Leaners are familiar with this kind of smart devices, for example, smart phones, computer tablets, computer netbook, and computer laptop. These devices have ability to access the Internet through wireless technology e.g. WIFI, 2G or 3G technologies. These mobile devices can help twenty-first century learners to capture, annotate, share, reflect, and exchange their idea for their learning. Learners use different kind of tools on their mobile devices, for instance, checking email, chatting, social network, and gaming.

The implementation of technology to enhance learning cannot be successful without an appropriate pedagogy. It is learning approach which instructor employs for their class in a formal context. What kind of pedagogy is compatible with characteristics of twenty-first century learners? In higher education we try to develop competencies for learners to archive their future work, which may be industrial or academic. For learner, the successful completion of a course may be different. In traditional education may refer to being at lectures, listening, reading, and remembering for an examination. However, nowadays requirements from working environment have been changed. Industries need people who can collaboratively work in team. Therefore, the successful completion of a course may mean working collaboratively with others learners to find, collaboratively decompose and recombine, and create new learning artifacts whose value include the extent to new contribution will be useful for others. For these learning approach requirements we are looking at a pedagogy called ‘Problem Based Learning’ (PBL) which is an active learning [2]. PBL is quite compatible with twenty-first century learners’ characteristics in the sense of personal learning since PBL is learner-centered and learner can control their learning. PBL students can design they own learning goal or achievement and learning process. Students work in team to complete a non pre-define problem. This can practice their teamwork skill, critical thinking and also their domain disciplinary.

This project concerns mobile technologies as a means to support learning in higher education with a particular focus on Problem and Project based learning environments. The project aims to investigate how mobile technology can support learning and collaboration. The project focuses on scenarios within higher education which adopts a problem and project-based learning approach often called the Aalborg PBL model [3]. Within some environments Aalborg university students have experimented and used ICT tools to support their project work.

2. Theoretical Perspective

The research will go in depth by studying four main concepts. The first is Problem-Based Learning-PBL. PBL has been focused since 30 years ago specially in medical school. It leverages students to engage with real life problem and take student-centered strategy.

Aalborg University has employed PBL since 1974. At the present they have refined their model called problem and project-based learning [3]. The second concept is Computer-Supported Cooperative Learning-CSCL concepts, which is a pedagogical approach which learning takes place via social interaction using a computer device. This kind of learning is characterized by the sharing and construction of knowledge among participants using technology for communication and sharing resources [4]. The concept has been adopted and implemented in class conductions among many universities. We are looking at learning process from project work collaboration which is mandatory for students to work on project every semester. The project will be evaluated and graded to students at the end of semester. Personal Learning Environments –PLE is concept which concentrates on learner as a person who makes decision what, when, where and how to learn for him/herself. The concept tries to explain what tools choose to learn for a particular learning knowledge [5]. The last part is about web 2.0 and mobile technologies. Web 2.0 as web technologies that aim to enhance creativity, communication, secure information sharing, collaboration and functionality of the web, they have led to the development of web culture communities and hosted services [6].

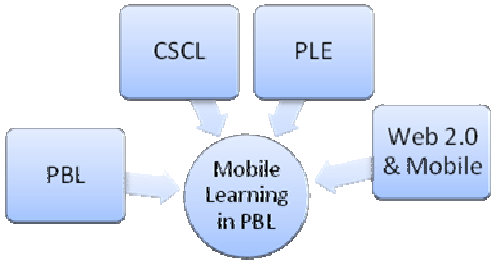

Figure 1. Theoretical study model

3. Methods

The research applies Action Research as the methodology for the project. It starts from cycle of data gathering by doing empirical study and applying the concept of ethnography. As in research question we start from looking at the learning current practice of students in PBL environment. In order to investigate the issue, we apply the concept of ethnography by observation, interview, and also getting students' narratives from their writing blogs. From these data collection, we can get reflection from students about both practices of using technologies to support their learning and also benefit from using them as in the second research question. In the last research question about how mobile devices change their learning practice, we plan to organize workshop to design their learning model with mobile technology and evaluate the model with focus groups.

4. Current Progression

Currently the project is in the half of second year. The project has been defined theoretical framework. The research has got result from empirical study as followed.

4.1 ICT support project collaboration survey

It was conducted across faculties at Aalborg University to find how students in PBL use digital tools for their learning and project collaboration support. The author used Diffusion of innovation model [7] to analyze how students adopt technology into the practice. So far

we have got 256 participants and we found that students get to know tools differently approach. Some department they introduced students about tools but others they have to learn from friends or by their own communities. Student they use a lot of tools as they are digital age but their need more advice about using tools for academic purpose. Some students they are really interested in using tools for their learning and group working but they do not know where to get support.

4.2 Student observation

The project had followed a group of students during Spring 2011 semester. It gives detail how students in PBL environment actually learn and work including how they use digital tools to support their learning activity. It is very different how students they use technologies to support their academic work. It depends on major of students, ICT skill, type of project, and also support from institution. The group that we followed, they prefer to meet face-to-face when they can organize. They separated to smaller groups for smaller task and sometimes they also work individually. They defined their working space both physically and virtually. Tools were used for collaboration, for instance, sharing resources, communication, and tracking progression.

4.3 Students' narrative

It is reflections on using tools for their learning and project collaboration support. Here we found students they have good attitude about using tools for group work collaboration. They tried to implement different tools. Some of them found it was very useful and continue using it. Some said they tried and it is useful, but not for the current project. We found that they need support in order to implement tools for their learning.

However, we still working on empirical study and hope to gain more evidence before making conclusion about PBL students using tool.

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