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# Mobile Learning for Higher Education in PBL Environments

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## ABSTRACT

This study is about the design and development of mobile technologies to support students' collaboration in groups during project periods in a problem oriented and project based learning environment. The study will take departure in the group work of students in the faculty of Humanities, Aalborg University.

## Keywords

Mobile Learning, PBL, Collaborative Learning, PLE, Integration

## 1. INTRODUCTION

This project concerns mobile technologies as a means to support learning in higher education with a particular focus on problem oriented and project based learning environments. The project aims to use web based and mobile technologies to improve learning and collaboration, and the research will focus on learning scenarios within higher education which adopts a problem and project based learning approach often called the Aalborg PBL model (Kolmos, K.Fink, & Krogh, 2004). Aalborg University has employed this particular PBL model since 1974, which is also referred to as problem oriented project pedagogy (POPP) (Lone Dirckinck-Holmfeld, 2002). In POPP, the students themselves define the problems to engage with and also how to organize this project work; theoretically, methodologically and practically, but work closely with a project supervisor (staff). This is where POPP differs from traditional PBL (problem based learning)(Tolsby, Nyvang, & L. Dirckinck-Holmfeld, 2002). Students in Aalborg University form groups, define problems and collaborate within team to work on the project with facilitation from the supervisor.

Students in Aalborg University have to do group projects every semester and the projects are very important for them because the project will be assessed and account for approximately half of their ECTS points. Therefore good collaboration skills and tools are critical to develop a high quality project. Within some environments, Aalborg University has experimented with and used ICT tools to support students' project work (Kolmos, K.Fink, & Krogh, 2004; Tolsby, Nyvang, & L. Dirckinck-Holmfeld, 2002) and there are online and blended master programmes applying a PBL approach (such as Master in ICT and Learning (MIL) and Master in Problem Based Learning (MPBL)). However, research, experiments and developmental work on utilizing mobile technologies in relation to this particular problem based learning approach is less developed.

The aim of the study is to design and develop mobile technologies which can improve the quality of students'

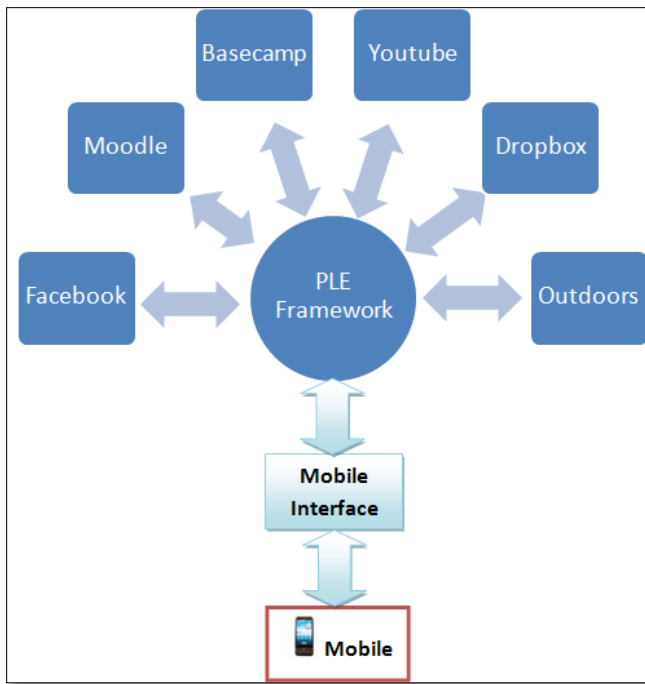
collaboration and project work. The overarching research question the research will address is "How can mobile technologies increase the quality of collaboration and group work in PBL environments?" Furthermore the research project will address these questions.

- What are the benefits students can get from mobile learning in a PBL environment?
- How do students currently use technologies to support their collaboration and how can mobile technology be used to enhance the collaboration in project?
- How do mobile technologies change the way students learn and collaborate?

## 1.1 Trends within learning technologies

Recently, ideas of Personal Learning Environments (PLEs) have attracted some attention, and some imagine these as replacements of the traditional institutional Virtual Learning Environments (e.g. Blackboard, Moodle or other VLEs/Learning Management Systems), whereas others argue that PLEs can supplement or extend the roles of existing VLEs. In a VLE, some argue, teachers organise the tools and structure dialogues (Crook et al., 2008, p. 36), whereas PLEs aim at supporting ideas such as: learning is ongoing, takes place in many different contexts and situations, and that the individual should play a central role in organizing and producing their own learning materials. Therefore, in a PLE management and personalisation of technologies is also part of the learning process (Attwell, 2007, p. 1). Some therefore argue that VLEs are hierarchical, teacher-centred and unable to effectively support student-centred, collaborative learning, whereas others argue that VLEs and PLEs can support and supplement each other (or fulfill different purposes) (Dalsgaard, 2006). We do not mean to side in this debate, but rather to point out that (broadly speaking) the calls for PLEs and educational uptake of current social technologies seem to revolve around supporting increased personalisation, ownership of tools, and control over the learning environment for students.

In relation to this the broader technological trend seems to be to develop general integration frameworks that allow users to choose learning tools by themselves; then integrate and use all those tools through the integration framework interface. These are also the intentions of the application we aim to develop as part of this research project and Figure 1 shows a sample scenario of such a system, which represent some of our preliminary ideas for a mobile application to support students' collaboration in groups.



**Figure 1: PLE Framework Example**

Figure 1 shows a sample scenario where a group of students want to use a PLE framework to support their group collaboration as part of their project work. For example they might want to use Facebook as community tool to communicate within their group, but also want to use the Moodle system which is provided by their faculty, as to get news relevant to their project and course work. They might want to use Basecamp as project management tool, and to use Youtube for sharing video clips as resources in the project. Furthermore, they want to use Dropbox as a file sharing tool and they use e.g. cameras and other tools (e.g. geo-tagging or audio recorder) to capture and share information during field work (e.g. when collecting data). The main idea is that they can integrate these tools in their PLE framework and the framework will provide mobile access features so they can interact with the system at any given time and place from their mobile phone. However, these are tentative ideas which will need to be firmly grounded in theoretical and empirical work, as we shall outline in the following.

## 2. METHOD

The research will start from theoretical study which focuses on problem oriented and project based learning, Web 2.0 and Collaborative Learning. The research design is to engage in empirical studies, such as interviews, group-work observations and also create a survey for students in faculty of Humanities. The aim of the survey is to get more information about how students collaborate

and work together during project time, but also about students' general use of technology. After the empirical study, we aim to conduct a workshop where students engage in developing design prototypes. On basis of the prototypes the researcher will develop the system. After the system development, it will be evaluated by groups of students.

We are now 5 months into the research project, and particularly the main author has done some empirical studies; included interviewing students about collaboration within their group during project periods, observing brainstorming sessions where students negotiated and discussed their project topics or ideas, and finally formed their smaller project groups based on their common interest. In the near future, we aim to design and launch the survey about ICT use in projects, and observe more closely their actual work in groups.

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