Using a blended learning approach to support problem-based-learning for teaching computing and programming with second year students - A case study based on C-programming

Janani Thevananth,
Senior Lecturer,
Department of Financial Management,
Faculty of Management Studies, University of Jaffna.
Sri Lanka
jananithevananth@yahoo.co.in

Abstract

This paper describes a blended learning environment that was developed for a course at the Asian women university, Bangladesh. It also describes an exploration of the use of a technology-enabled problem-based-learning approach undertaken with a group of second year students.

This study expresses the issues and implications of blended learning and teaching, with a special interest in developing a model for using a problem-based learning (PBL) approach to teaching. As stated by Kolmos & Graff (2003), the label 'PBL' is used to cover an amazing diversity of educational practices. Critical differences between practices are described by e.g. Barrows (1986), who mention the teacher vs. learner directedness as one important way of distinguishing.

The study is carried out with a qualitative and ethnography-inspired methodology among undergraduate students at the Asian University for Women in Bangladesh. In focus of the evaluation of the experiment and learning design is a learning cycle with three phases: conceptualization, construction, and dialogue. This approach is tested as a new model of blended learning and teaching for students in introductory computer programming.

Key Terms: Blended Learning, problem based learning ,

1. Introduction

Asian University for Women is an institute for higher education for women in Bangladesh. The University is composed of the following programs: The Access Academy, a year program and undergraduate program, students can earn B.A. or B.Sc. degree. The computer subject is made available for undergraduate.

The main focus of this study is identifying student learning problems of the subject of computer programming and testing the new blended model. This report summarizes the various problems experienced by different developing country students, (5 different developing country) and suggest some practical implications for designing new blended model.

Fig 1: Current Pedagogical teaching model in AUW

2. Problem Statement

Essi, L., Kirsti, A. & HannuMatti, J. (2005), have concluded that ‘Programming is not an easy subject to be studied. Many students have learning problems because of the intricate of the subject. In addition, what happens that resources for such a study are not show ample as to inspire the students to go ahead with their learning process untrammelled by any obstacle in the process. Also the student groups are large and heterogeneous and thus it is difficult to design the instruction so that it would be beneficial to everyone. This often leads to high drop-out rates on programming courses.’
2.1 The Learning Environment

Students are studying the Bachelor degree program at the Asian University, Bangladesh. Students from different 5 countries are studying in this University. The course previously involved a study of Blended learning technologies (fig 1) and combination of face to face and computer based. The course was very classroom oriented and was very hard to provide additional support to students.

In planning the delivery of the course a PBL and blended learning approach was developed. A new Moodle Learning Management system developed for students. The delivery of the course was designed around a series of weekly problems, each of which was intended to provide a context for student learning and loaded into Moodle. A series of capabilities was selected and the course content and activities designed to foster knowledge and skills acquisition.

The research questions is

- What are the learning problems and deficiencies associated with current pedagogic practices in computer programming languages in higher education in developing countries?

Teaching of Computer programming has created significant difficulties to both teachers and students. Blended teaching and learning combines face-to-face instruction and computer-assisted instruction to maximize students’ learning (Lee W, Joseph F, Martian C, 2008). The key component in developing an acceptance blended learning approach is students’ satisfaction (Iron et al., 2002).

Other core issues of this study are to measure students’ satisfaction with blended learning. Are students satisfied with current teaching model? Are they satisfied with the components in this teaching model?

3. Literature Review

Blended learning has been gradually introduced into the educational sphere over the last 20 years (Sharma 2010). Blended Learning is defined as 'The integrated combination of traditional learning with web based approaches (Oliver and Trigwell, 2005,p.17). More specifically, it is an intermingling of traditional classroom methods with various multimedia tools. These tools include video conferencing, e-mail, instant messaging or communications tools such as Moodle or Web CT (Sherma, P., 2010).

Problem based Learning is a delivery form that uses strong contextual elements in the learning process. In problem-based learning, students or learners are actively being in the process of learning and develop solution for the particular problem. The problem-solving process gives the learners ownership of the learning process and encourages the development of skills and knowledge that are transferable beyond the classroom setting.(Hung,D,(2002).

In many university courses, the learning outcomes that are sought comprise skills and knowledge acquisition. Successful learning is measured by the extent of the knowledge and understanding acquired through such means as examinations and assignments.

4. Methodology

There were 18 students in the second year batch, from Asian University for Women. Mid of the semester, I collected data using individual interviews, focus group discussion and personal contact for collecting data. The interview session was carried out in during the study break. The duration of the interview was approximately 1 ½ hour and it was video-taped. From the mid semester the new model was introduced as a learning management system, Moodle for teaching computer programming. The components of new blended learning model as follows:

![Fig 2: New Introduced Blended Learning Model](image-url)
5. Evaluation and Discussion

Majority (16 students out of 18) of the students didn’t know any programming languages before this course. Only two students had learned Java and C++ languages. There were also three students had used with HTML. All the students were familiar with computer handling and well involved in social network like facebook.

6. Future work

This field study report found that students were not satisfied the traditional teaching model and they were happy with blended learning model. This study didn’t give space for measuring the degree of components in the new blended learning model and to study the impact of the programming language and the environment used. There is a need for further investigation of learning problem and satisfaction of this Blended Learning model with different computer languages.

7. Limitations

1. Year 2010 Second year batch is the first batch of Asian University for Women. There are no senior batches to compare their examination results.
2. Asian University For Women is in Bangladesh. It has the International Support Committee and maintains as a high quality university (like developed country university). So that the results are not similar to compare with other developing country universities like Sri Lanka.

Reference:


