Guest Editorial I

Special Issue

Selected papers from the International Research Symposium on Problem Based Learning, IRSBL 2013

PBL ACROSS CULTURES

Motto: 'Knowledge grows in the process of sharing'.

Introduction

Problem Based and Project Based Learning (PBL) have proven to be a highly successful method for training professionals in higher education. After the establishment of PBL institutions in Canada, the Netherlands, Denmark and Sweden during the reform period in the 60's and 70's, many higher institutions in the US, Europe, Australia and more recently in Asia, Africa and South America have been implementing this educational method. As a consequence, the cultural dimension in PBL has gained in importance. This was the reason to choose the cultural dimension as the central theme of the fourth international PBL research symposium in Kuala Lumpur, Malaysia July, 2–3 2013.

The Dutch researcher Hofstede developed a model identifying six cultural dimensions, which can be used to explain differences in interaction patterns of people in general[1]. The six main cultural dimensions defined by Hofstede are: Power Distance, Uncertainty Avoidance, Individualism/Collectivism, Masculinity/Femininity, Long/Short Term Orientation, and Indulgence/Restraint. Based on data from subjects around the world Hofstede presents national profiles showing how the patterns of countries differ. For instance, Western countries like Denmark and Holland score comparatively low on the culture dimensions of Power Distance and Uncertainty Avoidance. Consequently it is common for students to discuss among themselves topics and share their knowledge in collaborating on a problem, or even to argue with a teacher. That is very much aligned with the PBL way of thinking. On the other hand, in cultures with a high Power Distance, it might be less natural to practice collaborative learning cultures. Evidently, the PBL group process will develop differently in different cultural environments—and the implementation of PBL will take different directions. Where it might be possible to establish radical change to more student centred learning models in cultures with low power distance, it might be very difficult in cultures with high power distance. Therefore, educational change processes might be very different and highly dependend on culture.

Under the title 'PBL across cultures', the symposium brought together researchers studying all aspects of the learning process in PBL, and those involved in the implementation of these approaches across the disciplines from all over the world. We have invited authors of conference papers to develop their articles and the following 10 articles were accepted after the review process. We are confident that the results presented in this theme issue represent a major step forward with respect to our understanding of the cultural impact on the PBL process.

The papers cover the following topics:

1. **Globalization of Problem-Driven Learning: Design of a System for Transfer Across Cultures—Kinda Khalaf, Wendy Newstetter, UAE**
   This paper reports on the development of an exportable model for effective Problem-Driven Learning (PDL), a problem-based learning pedagogy, transfer across cultures. The system is demonstrated using a case study in transnational exchange and cooperation between Georgia Tech (GT) in Atlanta, Georgia, USA and Khalifa University (KU) in Abu Dhabi, UAE around the design of a biomedical engineering course delivered using PDL. The results show that cultural relevance and sensitivity are critical to effective cross-cultural transfer.

2. **Discussions in PBL Project-Groups: Construction of Learning and Managing—Claus Spliid, Denmark**
   This article looks into how the development of discussion skills relates to learning and project-management using the Aalborg model of PBL. Through content analysis of groups' written reports and grounded theory group interviews, it is concluded that the discussions are central in the development of process-

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[1] G. Hofstede, Culture's Consequences, Comparing Values, Behaviors, Institutions, and Organizations Across Nations (2nd ed.), Newbury Park, CA: Sage Publications, 2003.

skills and competences and are served as a media for achieving learning and as a tool for developing skills essential for professional engineering practice.

3. **Instilling Profession Skills and Sustainable Development through CPBL among First Year Engineering Students—Khairiyah Mohd-Yusof, Aziatul Niza Sadikin, Fatin Aliah Phang, Azmahani Abd Aziz, Malaysia**

Cooperative Problem Based Learning (CPBL) had been shown to enhance learning while developing the desired professional skills and positive behaviour in Sustainable Development (SD). This paper describes a mixed method study on the impact of an Introduction to Engineering course on first year students as they go through three cycles of CPBL to solve a sustainability related problem. The mixed method study shows strong emergence of professional skills and SD at the end of the course despite the difficulties faced by students at the initial stage of learning.

4. **Assessment in PBL—Do We Assess the Learner or the Product?—Prue Howard, Matt Eliot, Mohammad G. Rasul, Fons Nouwens, Justine Lawson, Australia**

This paper explores the assessment in PBL in order to provide a reliable indicator of student capability and program quality and standards in the final year engineering projects in two universities in Australia. It is concluded that assessing the product rather than the learner degrades the opportunity to use projects as evidence of learning, but continues because it is easier for academic staff.

5. **Using Design Studio Pedagogy to Enhance Engineering Education—Shannon Chance, Mike Murphy, Gavin Duffy, Ireland**

This paper presents a rubric for measuring students' development of increasingly refined epistemological understanding (regarding knowledge and how it is created, accessed, and used) through student blogs in the University of Michigan's SmartSurfaces course. The overall result of the exploratory study indicates that design-based education can have powerful effects and collaborating across disciplines can help engineering students advance in valuable ways.

6. **Students' experiences of change in a PBL curriculum—Bettina Dahl, Jette Egelund Holgaard, Hans Hüttel, Anette Kolmos, Denmark**

This article reports the findings from an explorative mixed method study of how students have experienced curriculum change in PBL especially the course and project assessment. It is concluded that the alignment between project supervision and project exam has increased in the new curriculum as the exams of courses and projects are separated.

7. **The Transformation from Teaching to Facilitation: Experiences with Faculty Development Training—Erik de Graaff, Denmark**

This paper presents components of a PBL faculty-development training programme and discuss the relevance with respect to a faculty development strategy.

8. **An appropriate technique of facilitation using students' participation level measurement in PBL environment—Alias Masek, Sulaiman Yamin, Ridzuan Aris, Malaysia**

The objectives of this paper are to examine first-year polytechnic electrical engineering students' participation in PBL small group discussions and propose an appropriate technique of facilitation, with respect to the group members' participation levels among students. The research revealed that four classifications can be used to explain students' level of participation and they can be grouped into several combinations in order to explain the students' levels of participation in small-group PBL discussions.

9. **Determining the Elements of Problem Solving Strategies in Project-based Laboratory (PB Lab) Course—Nur Ayuni Shamsul Bahri, Naziha Ahmad Azli, Narina Abu Samah, Malaysia**

This study focuses on determining the elements of problem solving strategies that occur during Project-based Laboratory (PB Lab) teaching and learning (T&L) activities among electrical engineering students at Universiti Teknologi Malaysia. This analysis of the qualitative data shows that there are five main processes associated with the problem solving elements that took place during the PB Lab course activities, which led to enhancing the students' problem solving skills in the laboratory context.

10. **Enhancing critical thinking in a PBL environment—Aida Guerra, Jette Holgaard, Denmark**

This study aims to provide a model for understanding and enhancing critical thinking in a PBL environmental through theoretical and empirical studies. The results show that a model for critical thinking in a PBL environment is outlined emphasising a problem-solving process grounded in open and real life problems as well as a self-directed, collaborative and team based learning environment. The model also includes recommendations to overcome challenges detected in the empirical study, especially related to the scaffolding of group collaboration and use of theory in a self-directed learning environment based on real life problems.

We hope you enjoy reading this theme issue and hopefully you will find inspiration to contribute to the next steps of our understanding of PBL across cultures.

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