

ICEE 2008 Keynote presentation – Xiangyun Du

Sustainable Innovation in Engineering Education

– Reflection from a PBL approach

Abstract

The emergence of knowledge society brings in new characteristics of knowledge construction and learning process – technology-bounded, multi-dimensional, unstable, innovative, collaborative and complex. Professional competences and expertise become progressively more difficult to identify when problems are becoming increasingly ill-defined and across-disciplinary with involving a growth of various integrated issues like technology, environment, economy, culture, sustainability and society. This gives rise to challenges to universities, in particular, engineering universities, which traditionally have been playing a role of disseminating technical discipline focused and stable knowledge based on individual learning.

Questions have been posed to universities in the globalized society:

- How to help students gain contextualized knowledge and competencies which are connected with relevant cultural and collaborative environment instead of merely learning generalized knowledge and fixed skills?
- How to prepare students for their professional life with sufficient readiness to solve the complex and ever-emerging new problems collaboratively and innovatively?
- How can students be equipped with appropriate life long learning skills through their university lives?

In many instances educational research report that traditional classroom based and lecture centred education has not always successfully produced satisfactory answers to these questions or even addressed these issues.

On behalf of UNESCO chair in Problem Based Learning in Engineering Education, this presentation will discuss on the development of Problem and Project Based Learning (PBL) as an innovative pedagogy. PBL has been employed as educational philosophy and methods to provide the possibility for students to achieve interdisciplinary, sustainable, transferable skills, while at the same time exposing them to the complexities of global and cultural issues. In late 1960s and early 1970s, PBL started from being an alternative of lecture based pedagogy which focuses on improving teaching and learning. In the past two decades, it went through a developing process such as computer based PBL, across discipline based PBL, etc. High diversity can be observed at the current stage where aspects of sustainability and culture become essential. Examples and cases of PBL practice from diverse universities will be used in this presentation to inspire the reflection on sustainable innovation in engineering education from a PBL approach.