Strategies for Constructing Problem-Based Learning Curriculum in Engineering Education

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Abstract *The new era of knowledge -based economy coincides with the age of globalization defines the human factor as the main differential element in entrepreneurial competitiveness; this is why it is so important for the educational system to fulfill the requirements of workplace. However, engineering education must follow rapid diffusion of information, communication and technology too. It means that the curriculum in engineering education ought to be flexible and the instructors must care for it. To response the requirements of new age, the quality engineering education which is making entrepreneurial engineers who will be prepared for innovations, increase production processes understanding with management vision, is the only way of developing the top industry and satisfies the post-industrial society needs.*

Most recently, the decentralization of decision and production process, as well as the new ways of production such as modular industry, outsourcing and global mobility had call for the new competence in engineering education. Therefore, it is important to cultivate the student's diversified abilities, for instance the ability to solve problems, ability to use theory in practice, team working, self-evaluation, strategic thinking and realization of complex project through innovated teaching and learning methods.

The Problem-Based Learning (PBL) refers to an instruction method in which the teacher builds his instruction around a practical problem and encourages pupils to discuss the problem in small groups, with an aim to cultivate active learning, critical thinking, and problem-solving skills among them. That is to say, the PBL is an effective tool to foster students developing the critical and creative thinking skills as well as enhance students' innovation capabilities through the process of problem solving. Consequently, if a PBL process is to be carried out smoothly, the curriculum must be so designed that it can help students to learn actively.

This article addresses some strategies to show how to construct the PBL teaching curriculum in engineering education efficiently. These strategies were made in two aspects. First of all, the process of design a PBL curriculum can be divided into six steps, namely, understand curricular outlines, make the structural map of modular curriculum, make the comparative concept map of modular curriculum levels, select appropriate unit titles, transform units into scenes, generate content of each scene. Secondary, make a checklist for curriculum design, and use the curriculum structure, modular curriculum, curriculum level, available resources, content of scenes that are transformed from units, problem statement for specific goals, and motivation as the benchmarks for assessment.

Index Terms *Curriculum Design, Engineering Education, Problem -Based Learning*