

PROJECT BASED LEARNING-AN ENHANCED APPROACH FOR LEARNING IN ENGINEERING

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Abstract

In engineering studies, the undergraduates usually take up project as major subject in the final year of their degree programme. However, the incorporation of Project Based Learning (PBL) and integrated projects in each year can improve the learning of undergraduates. This paper provides a comparative study of Project Based Learning and traditional classroom learning. The desired learning outcomes and effects of PBL on under-graduates are also discussed. The study is based on integrated PBL which is incorporated in the course curriculum of Chitkara University, Himachal Pradesh. Two groups of under-graduate students of different batches have been considered for the analysis. The results show that the students who had PBL in 1st year and integrated project in 2nd year show better performance than the students who were not involved in PBL or integrated projects till 3rd year.

Key words: Project Based Learning, Integrated Project, Multidisciplinary approach, Learning Outcomes, classroom learning, effects and challenges

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1 INTRODUCTION

The conventional method of material delivery at undergraduate engineering schools is a combination of lectures, written examinations and laboratory sessions. The primary aim is to impart specific technical skills to the students. A typical four year engineering degree programme also focuses to develop on self directed learning skills of the undergraduates in the later years. In recent years, particularly as a result of Information and Communication Technology (ICT) related technological developments such as the World Wide Web, more contemporary pedagogical concepts such as Distance Learning and Problem Based Learning (PBL) have begun to appear in the modes of delivery of material in engineering [1]. However, one particular area of the curriculum which continues to challenge in terms of how it can be optimally delivered is *non-technical skills* and *soft skills* in general. Under this heading fall the obvious topics of communications skills, team work, project management and business and Intellectual Property related material which most degree programmes deliver through a combination of lectures, assignments, workshops etc [2]. A popular strategy to maximize the self learning skill and to promote intellectual development of the students while learning the subject basics at the same time is Project-Based learning.

“Project based learning begins with an assignment to carry out one or more tasks that lead to the production of a final product a design, a model, a device or a computer simulation. The culmination of the project is normally a written and/or oral report summarizing the procedure used to produce the product and presenting the outcome.” This broad definition of project based learning given by Prince and Felder [1].

This paper presents an integrated Project-Based Learning (PBL) methodology that offers a major interrelationship among all engineering streams in each year at Chitkara School of Engineering and Technology. The purpose of project based learning allows the students to take on the design and implementation of projects in a more realistic way and to apply this knowledge for solving real industrial projects. In project-based learning, students work in groups to solve challenging problems that are open-ended, curriculum-based, and often interdisciplinary [10,11]. Firstly, students decide how to approach a problem and look for a