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Learning through Projects in Engineering Education

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This paper explores different styles of project work carried out in engineering curriculum and presents some novel frameworks and ideas used for learning through projects in engineering education. Projects can influence an engineering curriculum in various ways. This can be done at a course level and/or program level. Educators, students and industry clients are approaching project work as a key for social, academic and industrial partnership.



In most Australian universities, in the final year, the students complete an individual project involving the application of skills and knowledge attained during their earlier years of their degree program. Through these projects students develop new abilities for application to a real-world problem, learn the art of modeling and simulation, design, development and management of an industry based or research based projects. Through project based learning teachers, students, and employers undertake different activities with varying purposes. This paper firstly presents data collected from final year undergraduate engineering units in all different engineering programs across the country.

The findings from this research illustrate how students in various disciplines perform projects and as important shows the alignment or non-alignment of delivery, learning outcomes, and assessment activities. The types of projects available to students in the universities are also presented. Based on the findings, the research suggests that styles of teaching and learning environments can be adapted to the student's learning mode that could meet the requirements of our society at present. Based on this, the paper presents some novel frameworks in curriculum development to assist with constructive alignment when an engineering curriculum is based on learning through projects. This is then mapped to the local context in engineering at Deakin University Australia, which looks at the learning through projects theme in specially designed engineering learning spaces.

Learning through projects has a positive effect on student content knowledge and the development of skills such as collaboration, critical thinking, and problem solving which increase their motivation and engagement. It is challenging task of teaching and teachers finding hard to implement the system, to integrate technology into projects in meaningful ways. When we look at the method of learning through Projects, it is a benefit for all the stakeholders such as students, industry, community, university involved in it. It provides us a framework for embedding experiential and rich learning activities, integrated with discipline-based curriculum that improves employment and career outcomes. The benefits of Project based learning include enhanced students' participation in the learning process (active learning and self-learning), enhanced communication skills, addressing of a wider set of learning styles, and promotion of critical and proactive thinking. ■