

Chapter 5

Assessment of Final Year Engineering Projects: A Pilot Investigation on Issues and Best Practice

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ABSTRACT

This chapter presents survey results of learning and teaching methodologies and assessment of Final Year Engineering Projects (FYEP) as employed across several participating institutions throughout Australia and New Zealand. As a result of preliminary dialogue with practitioners within each institution, a number of common issues and discrepancies have been revealed. These issues include a lack of transparency and consistency in the field. Report findings indicate the need to engage in further dialogue with supervisors, lecturers, and students engaged in the FYEP process to develop best practice in the FYEP paradigm.

INTRODUCTION

Final Year Engineering Projects (FYEPs) represent the culmination of students' collective learning experiences during their chosen course. Students should be capable of personally conducting and managing an engineering project to achieve a

substantial outcome to professional standards (Engineers Australia, 2005; Institute of Professional Engineers New Zealand, 2008). Such requirements are emergent from international engineering accreditation agreements, Washington Accord, International Engineering Alliance (International Engineering Alliance, 2009) to which the Australian and New Zealand accreditation bodies are parties. In the United States of

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America, The Accreditation Board for Engineering and Technology (ABET) has promoted and monitored development of capstone project work both to develop and assess individual students and to provide evidence for assessing standards in programs of study (McKenzie, et al., 2004; Howe & Wilbarger, 2006; Howe, 2008). Within Australia and New Zealand, supervisors and others involved in teaching and facilitating FYEPs have not yet managed to develop productive dialogue relating to assessment and learning and teaching methodologies. As a result, there is a lack of consensus amongst practitioners in this area. Furthermore, the ill-defined paradigm of capstone Engineering projects means that students are often uncertain of their academic expectations, leading to confusion and miscommunication.

Previous discourse during Australasian Association of Engineering Education (AAEE) conferences has indicated a number of common issues within FYEPs as they are undertaken in participating universities (Jawitz, Shay, Moore, 2002; Oehlers, 2006). In particular, the following have been identified:

- There are generally inadequate guidelines for students to choose appropriate projects with sufficient scope to demonstrate development and assessment of graduate outcomes (Rasul, et al., 2009).
- There is an apparent need to develop strategies to improve consistency of expectations of students, project supervisors, moderators and industry partners (Rasul, et al., 2009).
- Conflict exists between intellectual property issues and assessment requirements (industry partners).
- There are variations in resourcing and workload allocations for supervisors and funding support for students' projects.
- There is a lack of clarity about supervision and assessment requirements among teaching staff within and across institutions.

- Conflict exists between supervisor assessment and moderation assessment.

Research and scholarships work by Central Queensland University in association with other participating universities is beginning to initiate necessary dialogue pertaining to the improvement of teaching and learning practices within the Engineering discipline in particular. This report summarises dialogue amongst the author and representatives from a number of significant engineering institutions in Australia and New Zealand.

Following a review of Australian Learning and Teaching Council (ALTC) literature, work in this area has been precipitated by a failure “to identify scholarship related specifically to assessment and standards for capstone project courses in which students choose a project and work under guidance of an academic supervisor” (Rasul, et al., 2009). Although some ALTC research exists concerning group work and peer assessment, further investigation into the methodologies behind individual project work is required.

Research into prior articles written by a broad range of universities offering FYEP courses identified a number of key issues of concern relating to teaching and learning practices. In particular, a general lack of consensus on teaching and learning methodologies and project scoping came to the forefront. “Discussions among practitioners involved in scholarship in engineering education indicate that universities are failing to use FYEPs effectively, partly because FYEPs are different from most other undergraduate courses, and FYEP coordinators are professionally isolated.” Such issues may “result from insufficient preparation of and academic isolation of academic supervisors, a lack of general discussion about project expectations among faculty and lack of agreement about issues of educational task design and assessment.” In order to address these recurring issues, a preliminary profile of each participating university's course would need to be compiled (Rasul, et al., 2009).

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