

Chapter 13

Using Multiple Methods in Assessing Oral Communication Skills in the Final Year Project Design Course of an Undergraduate Engineering Program

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ABSTRACT

Engineering education researcher Rogers (2006) proposed that an assessment of engineering programs should use a multi-method approach to maximize validity and reduce the biasness of any one approach. Based on this reason, this study used two methods in the direct assessment of oral communication skills performance outcome of an undergraduate electrical engineering students' Final Year Project (FYP) design experience. In the first method, the Oral Communication Assessment Rubrics adapted from Norback et al. (2008) was tested for its reliability, consistency in the scores and ease of use. This was to ensure that the results were descriptive of the expected students' performance (Miller & Olds, 1999). Once faculty rater reliability was achieved and verified, the rubrics were refined and redrafted to obtain inter-rater scores for the assessment of the oral communication skills during the FYP seminar presentation. Descriptive statistics were used to draw inferences from the inter-rater scores. In the second method, the researcher used the final grades of these students which were obtained from the faculty end-of-course assessment of their FYP seminar presentation through the use of the faculty Seminar Evaluation Form (SEF). The scores obtained from SEF were reported in the Course Assessment Summary Report (CASR) in the form of the achieved Key Performance Indicator (KPI) of the students in each department in the Electrical Engineering Faculty (FKE).

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INTRODUCTION

The results from the inter-rater scores obtained from the first method described in the abstract were compared and analyzed against the final grades students received as reported in CASR. These scores were crossed tabulated and compared to identify any similarities and/or differences in the levels of oral communication skills demonstrated by the students. Recommendations for improvement on the future of the oral presentation assessment tool and processes for personal and program development were made.

The senior design project is the cornerstone of an engineering program at most institutions of higher education and it gives students hands-on and real-world experience with the objective of not only teaching the application of engineering principles, but also acquiring the behavioral skills of communication skills. Duff and Schildgen (2005), and Scales *et al.* (1998) proposed the use of capstone design courses or final year project (FYP) courses as it serves to integrate previous coursework and requires students to perform at a professional level, demonstrating technical expertise and communication skills. The FYP, if implemented accordingly, provides a unique milestone where the combined skills and conceptual attributes of the undergraduate engineering experience can be measured. In addition, an assessment of student confidence in their ability to work individually or in a team; design, build and test mechanical components, devices or systems; work closely with a faculty member and solve design problems with realistic constraints can be made. Thus, this research focused on the graduating undergraduate engineering students enrolled in the Final Year Project II (FYPII) design course who are in the final semester of Semester II, 2008/2009 at the Faculty of Electrical Engineering (FKE). Engineering students have to learn how to function collaboratively, acquire particular sets of competencies, and communicate effectively to fulfill common design objectives. Most of

the engineering subjects are taught in English and the language used in the implementation of the FYPII design course as well as the seminar presentation is in English. The students should be able to communicate effectively since they have completed two academic communicative English courses in their first year of study and another elective English course which focuses on professional skills in their second or third year. These English language communication skills course were introduced early during the first two years of the engineering experience and taught independently as stand-alone courses. Despite this, it was obvious during the observation of the seminar presentations, that some of the question and answer sessions were conducted in Bahasa Malaysia. Therefore, this raises the question, - Is communication skills reinforced and integrated in the later stage throughout the curriculum through a variety of different experiences? Since the senior design project is a significant part of an engineering program, the students' communication skills competency should have been fully developed by the time they do their FYPII design course and before they graduate. Numerous facets of the intellectual development of the graduates could be assessed by measuring technical and communication competencies. As such, incorporating tasks on communications alongside the design project tasks is beneficial in achieving congruency in the expected students' learning outcome.

ORAL COMMUNICATION SKILLS ASSESSMENT

Shuman *et al.* (2005) categorized professional skill outcomes such as communication skills as 'process skills,' skills that can be taught and assessed. Assessing student performance to demonstrate accountability has become a necessity in academia. This view supports ABET Criterion 3 which states that, "each accredited engineering program must have an assessment program with

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