

6th International Forum on Engineering Education (IFEE 2012)

Undergraduate Industrial Training Experience: A Win-win Situation for Students, Industry and Faculty

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Abstract

Undergraduate student industrial training programs in the engineering industry are mutually beneficial relationships that helps nurture student growth, enhance university-industry relationships, and challenge the faculty to include up-to-date information in the teaching curriculums. The engineering discipline in particular requires graduates to be well-prepared with real world experience so they can anticipate the working challenges. The industrial training program is a mandatory graduation requirement for undergraduates of the Faculty of Engineering and Built Environment, UKM. Students have to undergo a ten to twelve-week period of industrial training following their sixth semester of university study. Before the training period, students have to prepare a short resume and then determine their companies of choice. During the internship, students kept a daily log documenting the activities and will be monitored by a visiting faculty academic. Upon returning to the faculty, they have to complete a technical report and deliver a seminar presentation summarising their experience. This paper highlights the program description, defines the industrial training objectives and describes the implementation process and challenges.

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Selection and/or peer-review under responsibility of Professor Dr Mohd. Zaidi Omar, Associate Professor Dr Ruhizan Mohammad Yasin, Dr Roszilah Hamid, Dr Norngainy Mohd. Tawil, Associate Professor Dr Wan Kamal Mujani, Associate Professor Dr Effandi Zakaria.

Keyword: Industrial training, Engineering education, University-industry relationship;

1. Introduction

Industrial training or internship programs have been an important part of many engineering programs in the world [1,2]. The link between academia and industry is seen as very necessary for the growth of the students. One

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of the essential missions of universities is to meet the requirements of the stakeholders. For graduates of the Faculty of Engineering and Built Environment, industry employer is one of them. Hiring rates and the satisfaction with graduates' performance in industry indicates the quality of the university's academic programs.

1.1. Positive effects of industrial training as part of engineering education

By combining formal academic education in university with suitable industrial training period, researchers have found that such experience will affect students in their CGPA, duration of time in school, and starting salary [3]. Several other studies also found that there are positive outcomes for students in terms of academic standing and higher cumulative grade point averages than for non-experienced engineering majors [4,5]. In addition, industrial training experiences decrease job search time and increase the probability of promotion and advancement after hire [6].

Other outcomes of a university-industry relationship is that it would enable the faculty to anticipate the shifts in industry trends and can gather industry feedback on student performance and program impact that can be used to adjust the curriculum and study programs accordingly.

1.2. Industrial training as part of accreditation requirements

Starting from the year 2003, the Faculty of Engineering and Built Environment (FKAB) of the National University of Malaysia has implemented Outcome Based Education (OBE) as embedded in the Accreditation Board of Engineering and Technology (ABET) criteria. This is also in line with the engineering program accreditation requirements outlined by the Malaysian Engineering Accreditation Council (EAC). To ensure a successful OBE, the measurement and assessment of each targeted outcome is taken very seriously. By doing so, will enable the faculty to continuously monitor the quality of its engineering education.

The industrial training program in FKAB is implemented as a compulsory course that students should undertake after going through six semesters of university study. Student performance in the course is taken into account as one of the elements towards accreditation of the university engineering program.

2. Description of the industrial training program at FKAB

Although the industrial training program in the faculty is compulsory as a prerequisite to graduation, the course grades is not taken into account in the calculation of a student's Cumulative Grade Point Average (CGPA). However, the grades will give a clear indication to the potential employers on the suitability of the graduates as a potential employee. Thus, undergraduates have to ensure that they perform well during the training period in order to achieve excellent grades.

2.1. Program objectives, structure and management

One of the objectives of the industrial training program is to expose students to the practices in engineering specific to their chosen field of study and industry. Engineering industry often uses the most advanced technology in their operations, and by spending some time in such environment, students will gain some new experience and knowledge that would be unavailable at university.

Based on a survey of undergraduate catalogues of ABET-accredited institutions, Stephan [7] determined that in nearly 70% of the institutions, there is no ethics-related course requirement for all engineering students. In the faculty, engineering ethics is taught in the form of a coursework taken as part of study credit. The industrial

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