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# A Study of Alumni Feedback on Outcome Based Education in the Faculty of Engineering & Built Environment, Universiti Kebangsaan Malaysia

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## Abstract

Today, life-long learning is a way of life and Malaysian universities took this opportunity by offering executive masters programs to engineering managers and industrial practitioners to prepare themselves for moving up to higher job ladder. This paper present findings from an alumni's survey conducted between July and August 2011 with respect to program relevancy, appropriateness of program objectives (POs) and program educational outcomes (PEOs). A set of self administered survey questionnaire was developed and sent to the alumni via postal mail and email. Their feedbacks would be used to update this program POs and PEOs to ensure their appropriateness and relevancy. Survey results show high overall values of alumni perception of POs (i.e. between 4.22- 4.29) and PEOs (i.e. between 4.24 - 4.54). In addition, the standard deviations for all POs and PEOs are less than 1.0, which shows common agreement of the perception of importance by the alumni.

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*Keywords:* alumni; feedback; program; objectives; educational outcomes; survey

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## 1. Introduction

In the era of rapid science and technology advancement, higher educational institutions need to provide programs that are relevant and appropriate to the market needs. Many consumer products and production machineries were developed with sophisticated features and capabilities for human use. The key to sustainable organizational and business survival in the marketplace is by creating and developing products and services as required by customers (Deros and Khamis 2009). Today, product manufacturers and industry leaders must be able to satisfy their customers' expectations for high quality products and services, while dealing with the realities of high production costs, soaring raw materials prices and intense global competition (Deros and Mohamad 2009). World class

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manufacturing companies' needs cross-functional and multi tasking engineers and managers, equipped with a solid technical background, a firm grasp on business matters, and ready to lead diverse teams for accomplishing high quality product and process efficiency. To achieve this, curriculum for the Master of Engineering in Manufacturing System Engineering program designed to provide solid fundamental theoretical and practical knowledge for individuals seeking to manage manufacturing operations and management in internationally competitive environments (Post Graduate Guide Book 2010). The program curriculum includes a wide variety of engineering and business management modules. It allows manufacturing systems engineering graduates to build the required cross-functional expertise to drive creative and innovative product development, reliability and efficient production system, which could deliver high quality products and services to the customers on time and at the right price.

In the past, survival of a manufacturing company was primarily related to how much goods it was able to produce and later, push them into the market. Today, rapid changes brought about by science and technology development requires experts with creative knowledge and innovative ability in designing high quality products and equipment for daily use (Saman et al. 2007). Therefore, teenagers are urged to explore and to be involved in the manufacturing systems engineering field to fulfill this challenge from science and technology. For a new product development to be effective; a systematic approach is necessary to understand the financial management's factor and it should be firmly attached to future product development processes (Sullivan et al. 2008).

## **2. Needs for Knowledge in Manufacturing Engineering Systems**

Initially, Master of Engineering in Manufacturing Systems program was designed and offered to cater the need of manufacturing sector in Malaysia. In the 1990s, Malaysian economy was experiencing a transition from an agricultural based economy such as: rubber, oil palm to manufacturing of electrical, electronics and automotive products, which requires skilful manufacturing engineers and managers. This program strives to prepare innovative and creative manufacturing engineers and managers, capable of enhancing products and services quality, productivity and efficiency of manufacturing systems. This objective could be accomplished by equipping them with advanced skills in manufacturing engineering disciplines, cross functional team work skills across wide range of engineering disciplines, understanding of the complete product development and manufacturing processes (Mustaza et al. 2008). Manufacturing systems engineering program provides: knowledge on management; problem solving skills; ability to lead and manage successful project; and quality improvement teams. Current internal, external and globalize challenges have put a lot of pressure to manufactured products produced in Malaysia and their ability to compete with respect to quality, cost price and delivery. In other words, masters in manufacturing systems engineering program is relevant and important prerequisite to Malaysia vision 2020 achievement and realization. To do this, the Department of Mechanical and Material Engineering, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia is equipping the manufacturing systems engineering graduates with up-to-date knowledge and tools to keep them abreast with current industrial development and market challenges. At present there are many career opportunities that await the manufacturing engineering graduates to serve in various manufacturing industries. In short, a career as manufacturing engineer or manager is focused towards improving efficiency of manufacturing processes and management of production systems, equipment and human resources management for manufacturing a particular product or providing a service (Deros et al. 2008). Today, career opportunities for manufacturing engineers and managers has increased significantly to face globalization challenges, the national vision 2020 and various trade agreements such as ASEAN Free Trade Agreement (AFTA) signed between ASEAN member countries comprising of Malaysia, Indonesia, Singapore, Thailand, Vietnam, Cambodia, Laos and Myanmar. As a result of AFTA, trades between member countries had increased significantly and thus need more engineering managers and engineers with higher management skills and up-to-date engineering knowledge to manage and run engineering businesses.

## **3. Methodology**

To perform this study, a survey questionnaire form was developed, it comprise of four main sections: organizational profile, alumni profile, evaluation on statements with regards to perception of importance for program objectives (POs); and statements of importance of program educational objectives (PEOs). This assessment form had used the Likert's scale, which is given the number 0, 1, 2, 3, 4 and 5. For statement of importance, number:

0 - not relevant; 1- not important; 2 - less important; 3 - neutral; 4 - important; 5 - very important. The survey questionnaire was distributed to 120 alumni of this program via postal mail, email and by hand. A cover letter was attached to the survey explaining the objectives of the survey and what is required from them. It was highlighted to them that the survey was voluntary, anonymous, and confidential. The respondents were not required to identify themselves and were asked to give sincere answers. The data collection took almost 2 months because many respondents did not reply on the first email. Later, the data was processed and analysed using the SPSS software version 16.

#### 4. Results and Discussion

From Figure 1, it can be seen that 57.1% of respondents are working in private sectors and 42.9% are from government sector. The three major types of industry, where the alumni of this program are currently working are: education (50.6%), followed by manufacturing (26%), and services (9.1%) respectively.

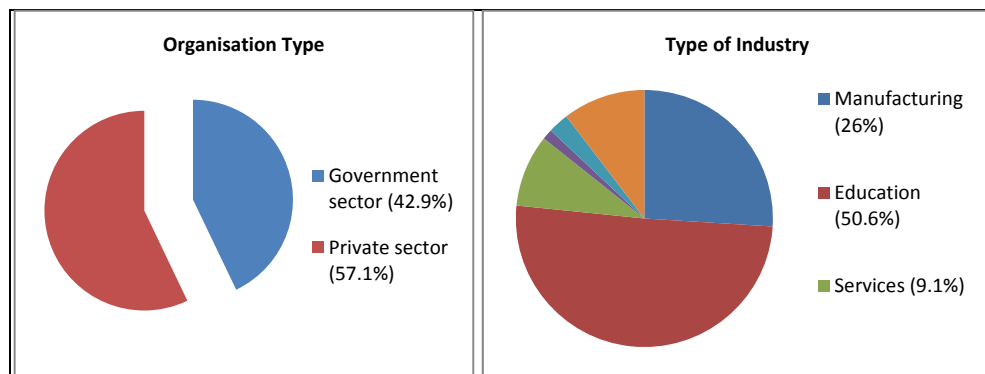


Figure 1. Profile of respondents

These evaluations are represented by their mean values as well as the standard deviations to show the spread of the data for each attributes (Abdullah et al. 2009). Then the means of the POs and PEOs are calculated by averaging the means for all attributes belonging to the PO and PEO. These results are based on 77 survey forms received during the month of July to August 2011. The mean values with respect to alumni's perception of importance of the Program Objectives (POs) are summarized in Table 1. Meanwhile, the mean values of alumni's perception of importance with respect to Program Educational Objectives (PEOs) are summarized in Table 2.

From Table 1, it can be clearly seen that from the overall alumni's perception of importance towards all the three POs are quite high. Their values range from 4.22 to 4.29, located within the important to very important region in Likert scale. The standard deviations for all three POs are less than 1.0, which signal common agreement of the perception of importance by the alumni (Abdullah et al. 2009). Thus, it can be concluded that the alumni still perceive these POs are important and thus may be kept in their current form.

Table 1. Means and Standard Deviation of Alumni's Perception of Program Objectives (POs)

Program Objectives (PO)		Perception of Importance
PO1	A graduate with the ability acquire advanced knowledge related to manufacturing systems engineering	4.22 (0.657)
PO2	A graduate with special expertise in manufacturing systems engineering	4.26 (0.589)
PO3	A graduate who is able to contribute and work in national/international work environment	4.29 (0.719)

From Table 2, it can be clearly seen that the overall alumni perception of importance all five PEOs are high. Their values arrange from 4.24 to 4.54. The standard deviations for all five PEOs are less than 1.0, which shows common agreement of the perception of importance by the alumni. Thus, it can be concluded that the alumni still perceive these PEOs are important and thus may be kept in their current form and do not need to be revised.

Table 2. Mean Value of Program Educational Outcomes

	<b>Program Educational Outcomes (PEO)</b>	<b>Perception of Importance</b>
PEO1	Ability to acquire and apply technical knowledge in manufacturing systems engineering discipline	4.25 (0.566)
PEO2	Ability to perform research project planning, analysis and present research results orally and written	4.32 (0.608)
PEO3	Ability to integrate knowledge and manage advanced problems related to manufacturing systems engineering	4.24 (0.613)
PEO4	Ability to function effectively as an individual and in a group with the capacity to be a leader or manager as well as an effective team member	4.41 (0.529)
PEO5	Ability to practice lifelong learning	4.54 (0.573)

## 5. Conclusions

Manufacturing system engineering is a post graduate program offered to students using the executive mode for practicing manufacturing engineers and managers. During their period of study, students' involvement during lecture, tutorial and case study discussions is highly practiced and emphasized. Each student is required to participate during oral presentation session in delivering the results of his/her course project work. Students' involvement during lecture in the class and oral and written presentation of their project work shows their high confidence level to ask questions and share their views with respect to manufacturing systems engineering. Referring to discussions of survey results shows the alumni have provides positive feedbacks with respect to their perception of importance of the POs and PEOs statements. This survey had revealed that large majority of alumni that took part in the survey believed the present POs and PEOs for Masters of Engineering in Manufacturing Systems Engineering are still relevant with the current industrial and technological environment. In this paper, an attribute based evaluation method was used to assess POs and PEOs statements based on alumni's input. By using this method, problematic attributes which can lead to unfavoured statement can be revised and reformulated to ensure that the programme meets the expectation from the alumni. In conclusions, the survey results strongly indicate that the present POs and PEOs for the Master in Manufacturing Systems Engineering are still appropriate and relevant.

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