

Study of Critical Success Factors in Engineering Education Curriculum Development Using Six-Sigma Methodology

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Abstract

Highly skilful and competent human capital especially engineers are critically needed to accelerate and contribute efficiently towards the development of technology in view of spearheading much of Malaysia's transformation agendas. Hence, Institutions of Higher Learning (IHL) are required to play a pivotal role to produce graduates, who are equipped with sound engineering based knowledge, technical competencies along with related desired attributes to support the nation's transformation roadmap. As employability of graduates forms as one of the important Key Result Areas (KRA) of all IHL, interesting active learners teaching methodologies such as Outcome Based Education (OBE), Problem Based Learning (PBL), Project Base Learning, Case Based Learning (CBL) and TRIZ has been infused in the curriculum to ensure that connectivity prevails between classroom instructions and the curriculum contents besides producing industry ready graduates. However, rapid technological development at work front has created an impact towards employment of graduates, which calls for an immediate redefining of current technical attributes to cultivate elements of creativity or "out of box" thinking approach to spark ideas of highly innovative that are of commercial value to generate revenue for the sustainability of businesses. Hence, this study is to determine the critical success factors required in engineering education curriculum to produce engineering graduates of global minded workforce where adaptability to new conditions and creativity for innovations are much sought after by industries.

Keywords: Outcome Based education, Problem Based learning, Continuous Quality Improvement;

1. Introduction

As Malaysia moves towards becoming a developed nation by the year 2020, it needs to create a better educated and a more highly skilled population to spearhead much of Malaysia's transformation agendas. However, the era of globalization has played a crucial role in influencing the current trends in the engineering education sector. Hence, Institutions of Higher Learning (IHL) are required to play a pivotal role to produce graduates, who are equipped with sound engineering based knowledge, technical competencies along with related desired attributes to support the nation's transformation roadmap.

Universities are usually classified as non-profit organizations that perform the primary role of imparting knowledge to undergraduate students and are deemed to be the focal point to generate knowledge in abundance and to conceive new innovative ideas that will lead to technological breakthroughs.

Hence, in order to assist Malaysia in many of its transformation agenda targeted by year 2020, engineering graduates produced by universities and other engineering providers are expected to well prepared with elements such as strong analytical skills, practical ingenuity, creativity, good communication skills and business goal oriented, leadership and professionalism as well as thirst for discovery of new knowledge [1].

Engineering education is often perceived as a process of imparting valuable engineering concept and vast theoretical knowledge coupled with matching practical skills in view of producing engineering graduates who are able to play a dynamic role in assisting to shape the future technological society of a nation. However, engineers

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