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Innovative Practice in Producing Competent Malaysian Engineers

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Abstract

This study presents an innovative practice in the Malaysian engineering education system which originated from the historical development of Malaysian education. The historical development has instigated the two streams of Malaysian higher education sectors; public and private universities as well as the university programme offerings and the language of instruction. In order to extricate itself from the system introduced by the British, Malaysia has introduced an innovative element into its engineering practice. The research applies the qualitative approach whereby inductive and deductive analytical strategies were performed. The findings revealed that the Malaysian education system has advanced into an independent own mould engineering education system which is very much shaped by Islamic values and beliefs and, the Malaysian culture - with the aim of producing innovative and competent engineers to compete in this globalized world.

Keywords. Engineering education, Islamic values, competent engineers

Engineering Education Landscape in Malaysia

The demands from industries necessitate higher education institutions to supply creative and innovative engineering workforce for the 21st century. This paper highlights the innovative practice of Malaysian education specifically focusing on engineering human capital, independent from the former British colony. Malaysia earned its independence from the British in 1957, some 58 years ago. Engineering education constitutes a different model in the course of framing Malaysia into a system. The influence of the British on the Malaysian education system has advanced to an independent own mould engineering education system which is very much shaped by Islamic values and beliefs, and the Malaysian culture.

In order to supply creative and innovative engineering workforce for the 21st century, there is a grave need for higher education institutions to promote innovative thinking and creative experimentation of future engineers. A report by the World Bank [1] indicated that Malaysia will need to “transform itself into an innovative economy...where science, technology, and engineering are integrated into the production process and where creativity, imagination, knowledge, and design capability are embodied in well-educated skilled workers who are the main source of national prosperity and wealth”. With the current statistics of 10,797 professional engineers and 69,222 graduate engineers [2] engineering contributes 0.66% of 12,215,497 labor force in 2011 [3]. Malaysian education has been greatly influenced by the British. This has not only affected the education system but also the courses taught to university students. This paper will feature the influence of the British system into Malaysian education and discuss the innovative approaches that characterize Malaysian engineering graduates. The findings will explore the following issues (i) the impact of the British influence on Malaysian engineering education and (ii) the innovative practice of Malaysian engineering education.

Methods

This research applied the general inductive approach in analyzing qualitative data [4]. An inductive analytical strategy was applied to design the analysis framework for this study. By inductive, the authors have actually referred to a framework which came about through interpretations made from

engagement in detailed readings of literature. The framework was later employed to structure the findings of this research. Most qualitative research emphasizes the creation of framework rather than imposing an existing one in this study. It should be noted that certain concepts are more pronounced because the nature of this research is on policy studies. Applied policy studies contain well-defined objectives which are formed by certain information requirements [5]. "Hence, any output from the research needs to be appropriately targeted towards providing 'answers'... This in turn has important implications for the form and functions of the analysis undertaken" [5]. A deductive analysis was later performed to investigate whether the analysis are consistent with prior framework identified.

The impact of the British influence on Malaysian engineering education

The presence of the British from 1874-1957 has affected the Malaysian higher education system mainly on several issues: a) university program offerings; b) the language of instruction in universities. This paper will highlight the segregation of practice in the Malaysian higher learning scenario even after 58 years of independence from the British.

Innovative Practice in the Malaysian Engineering Education Scenario

The new engineering education model for Malaysia was proposed by Megat Johari et. al. in 2002. The study was commissioned by the Malaysian Council of Engineering Deans and the Institution of Engineers Malaysia to provide a framework for the design of engineering curricula. It proposed a four-year engineering degree program instead of the intensive three-year program which was undertaken by some universities then. Malaysia's engineering model was previously largely influenced by the British colonial system whereby a lot of emphasis is given on the technical contents of the engineering course. The new model aims "to produce graduates with strong scientific base and are innovative, professionally competent, multiskilled and well respected" [6]. It was also proposed that 70% of the total credit of the engineering program is allocated for engineering content, while the remaining 30% for the non-engineering content. The scientific, professional and practical components of the engineering program are classified as engineering content and very much engineering-based.

The non-engineering contents are the highlight of this paper. They were made up of courses such as Islamic Studies, Malaysian Studies and Ethnic Relations, to name a few. This is to inculcate the humanistic aspect of the engineers-to-be and train them to be ethically and morally responsible to the nation [6]. Institutions offering post-secondary education must offer Malaysian several compulsory courses as stipulated in the Act 555 [7]. This paper compares the engineering curriculum in several countries to show the uniqueness of the Malaysian practice

in producing competent engineers which is very much shaped by Islamic values and beliefs and the Malaysian culture.

Conclusion

The British has influenced the Malaysian education system and its impact is felt even after 58 years of independence. The engineering education curriculum has been improvised to engage future engineers with Islamic values and beliefs, and the Malaysian culture. This innovative practice has actually demonstrated that Malaysia has constructed its own mould of the engineering education system, free from the strong influence of the colonial system. This research is timely as it presents the innovative practice of Malaysian higher education sector in the context of developing countries such as Malaysia.

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