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Issues And Problems In Industrial Mechatronics Program For Polytechnic Graduates

¹Sharifah Nurulhuda Bt Tuan Mohd Yasin, ²Dr Azman Bin Hasan, ³Mohd Fauzi Bin Mohd Yunus

^{1,2}Universiti Tun Hussein Onn Malaysia, Faculty of Technical and Vocational Education (FTVE), 86400. Batu Pahat Johor. Malaysia.

³Politeknik Ibrahim Sultan, Department of Mechanical Engineering, Km 10, Kong Kong road. 86400. Pasir Gudang Johor Malaysia.

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ABSTRACT

Background:The job market today requires graduates are competent and skilled in all aspects. Most employers have certain criteria for selecting employees of academic achievement and good soft skills. **Objective:** This study aims to identify the issues and problems in the industry for polytechnic graduates in Mechatronics program. In this study, the instrument used was a semi-structured interview. Interviews were conducted with two people from the industry, and 5 polytechnic graduates were employed. **Results:**The interview was carried out to see in the context of the CIPP model. All interview data were collected in the transcript to identify issues and problems. **Conclusion:** Results showed that there was chaos of knowledge about balance four key areas for the Diploma Mechatronics Engineering at the Polytechnic

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INTRODUCTION

The main agenda of the transformation plan is to develop competent human capital across the country to meet the demands of a developed country by the year 2020 and this is a new strength to the Polytechnic. Transformation framework described in the 10th Malaysia Plan. Transformation Plan is based on the The Empowerment Polytechnic of through the development of new programs in specific core, increasing the knowledge of lecturers, who are competent and skilled staff and excellent work culture (Sahul Hamed, Mohd Amin, & Mohd Ali, 2010). This is supported by Aspalila and Nin Embrace (2010), one of the core objectives of the Polytechnic Transformation Agenda drafted in 2009 until 2020 that the empowerment of polytechnic people with knowledge and skills. Polytechnic people refer to students, lecturers and staff of the polytechnic.

Industry Sector is one of the driving forces for the development of the national economy. Technological developments in Malaysia have become increasingly competitive in the world market. Workforce should also be trained to achieve the required standard in the job market. Based on this perception, Polytechnic holds a key role in the development of human capital in the middle of the channel the skills and education in the technical, trade and the service sector (Sahul Hamed *et al.*, 2010). Human capital can be described as an individual who has a productive capacity that can be used to produce goods and services. Saglam and Oral (2010) highlighted three key elements required by the industry can be listed as, raw materials, manpower and machines..

On the other perspectives, the government is very concerned to this needs where it is not only dependent on a highly educated workforce and even has the resources and skilled workforce. In this claim Technical and Vocational Education (TVE) plays an important role. According to Mohd Izyan, Muhammad Sukri, & Mohd Safarin, (2012) explains the high efficiency in operations technology, foreign language, the provision of employment and entrepreneurial skills are just some of the skills that are required in addition to specific technical skills in their respective industries. Therefore, the programs offered, course and curriculum guide that should be applied in tandem to produce a highly skilled workforce for the industry. Educational institutions especially polytechnics and industry should be working together to ensure that the produced curriculum is meeting their needs.

In this paper, researchers analyze scientifically about issues and problems in the industry for polytechnic graduates in particular Mechatronics Program. In this aspect, Polytechnic graduate program in Mechatronics is the human capital that has been produced and is the product of CIPP model. In general, the field of Mechatronics can be described as basic and techniques in an integrated framework for future services and production-oriented products and machines. Basically, Mechatronics can be defined in many different ways, but in terms of functionality, it is a combination of precision mechanics and use the synergy of engineering, control

Corresponding Author: Sharifah Nurulhuda Bt Tuan Mohd Yasin, Universiti Tun Hussein Onn Malaysia, Faculty of Technical and Vocational Education (FTVE), 86400. Batu Pahat Johor. Malaysia.

theory, computer science, technology, sensors and actuators. All are designed to improve products and processes to focus on mechanics, electronics, control and computing technologies and molecular engineering. Combined fit to produce a simpler system, ergonomic, reliable and versatile. (Ministry Of Human Resource, 2008). Fields Mechatronics provide extensive employment opportunities even in small companies also require auditors general to perform the functions of mechanical and electrical engineering. (Allen, 2006).

Methodology:

There were approach used in this study: semi-structured interview .The purpose of this interview is to gather information about issue and the problem of employment among polytechnic graduates in the fields of task allocation in Mechatronics industry. A few sessions interviews were carried out with engineers and technicians in the factory .In addition, the researchers also have selected five graduates in Mechatronics to be interviewed.

Results:

Preliminary analysis conducted on graduates who have worked in the industry Mechatronics, a slight confusion of reference in the industry. Graduates who have Mechatronics background should be competent working in the Mechanical, Electronic, System, Electromechanically, Oil & Gas, Manufacturing, and Automotive.

Interviews were carried out with the assistant engineer to examine the need for knowledge and expertise in the field of industrial tasks provided in Mechatronics. Feedbacks received from the interview are as follows:

"I monitor the number of graduates from polytechnics who worked as a technician has problems to machine involving automation and programming"

(Senior Technician 1)

"In our factory, workers in the field of Mechatronics will be placed in the maintenance and control automation of robotics Just that their work will be monitored especially for newbies"

(Engineer 1)

Other than that, five fresh graduates also gave their views on the issues and the scope of Mechatronics in the industry:

"I practice the knowledge that I have learned at the polytechnic but I still lack confidence in the ability of my knowledge ... I learned the mechanical, electrical and electronics, but when it involves the automation it was difficult to understand ... I have to do my own research on that particular problems Manual study ..."

(Graduate 1)

"... I was troubled when using more sophisticated robotic machines and other machines, because of my lack of exposure to programming ... In Polytechnic I only learn the theory so now I have to depend in books reading and ask people who are experts ..."

(Graduate 2)

"...Mechatronic involves four section of engineering, problem that really confused me that I have to expert in which part....."

(Graduate 3)

"... When I was interviewed, I have been asked about the specification of skills and knowledge in the field of Mechatronics..... The career field is very challenging because it requires creativity and skills to design and develop systems such as automotive and intelligent product. In Malaysia, I think this area still needs to be expanded and the labor market more focused on private companies, especially high-tech companies. "

(Graduate 4)

"... The field of Mechatronics has many branches, I have to know a lot of things but the great thing when I applied for the job, the task field that I ask is very broad."

(Graduate 5)

Discussion:

Employability data obtained from MMAP 2013 Curriculum Development and Evaluation Section, Department of Polytechnic, only 76.3% of the former students of Diploma in Mechatronics Engineering (DEM) working on the field. In statistics released DEM program was ranked seventh out of 16 programs offered in the

Department of Mechanical Engineering, Marine, Air Craft and Petrochemicals. (Department of Polytechnic Education, 2014). In addition, the feedback gathered from industry shows that Malaysian Polytechnic students do not meet the level of competence and work attitude expected by the industry (Juen, Pang, & Vitales, 2010).

According to interviews with engineers and technicians at factory, they agreed that there was some leakage in terms of knowledge and skills confusion about the balance of the four main areas of Mechatronics which are mechanical engineering, electronic engineering, computer technology and control systems. Polytechnic graduates should be competent in four areas of engineering. This to some extent may increase the percentage of unemployed fresh graduates in the field of Mechatronics as less competent graduates in terms of knowledge to produce an integrated system.

Referring to the definition of Mechatronics, Edin Grimheden (2013) states Mechatronics is an academic subject that emerged in the late 1960s and most commonly used definition of Mechatronics is a synergistic integration of mechanical engineering with electronics and intelligent computer control in the design and manufacture of industrial products process. Grimheden (2006) state evolution in the context of engineering education Mechatronics refers the creation of more complex products with a focus on the synthesis of the analysis. The challenge for fresh graduates to compete in today's job market.

Thus, revolutionary change and redesigning curriculum, improving the style of teaching and learning approach in R & D and developing new ways to assess students is one of the initiatives made by the Department of Polytechnic Education in meeting the criteria and standards issued by the Malaysian Qualifications Agency (MQA) (Siti Jariah & Noor Aidi, 2010).

In terms of findings from interviews with graduates, the study will examine the issue of lack of knowledge in the field of robotics and automation are the centerpiece of the control system. To meet the challenges of work and employability, graduates will be judged by the question of what knowledge and skills they have learned from their education. They need to equip themselves with the technical expertise or the risk of being retrenched. (Muhammad Azmi, Roseleena, & Zulkifli, 2011).

Graduates who were interviewed also said that they lack the confidence to explore the large machine used in high-tech industries such as manufacturing and assembly industries, manufacturing home appliances such as washing machines, TV, radio, electric cookers, etc.; manufacturing of electronic goods like cameras, copiers, etc; Factories of food processor; Oil and gas companies; High-tech firms such as the space industry; engineering firms & product development; manufacturing firms automation systems; Firms biomedical engineering; software development firms; and bodies such as research and development institutions, SIRIM, etc..

Based on Salwuan, Noor Hanisa & Siti Noor (2010), there are significant differences when pursuing formal education to acquire the theory from lectures notes with what is expected by the organization as graduates entering the workforce. Commissioner of Labour, Awang Haji Omar bin Haji Abdul Rahman on September 28, 2005, asserting that equip school leavers with the skills and knowledge to enter the job market. Exposure to the world of work will allow students to apply the theory learned in the classroom. Therefore, technical and vocational education is responsible for providing employees a competitive, complete with technical skills, literacy high on technology and generic skills (Ayuba and Gatazi, 2009)

Conclusion:

As a conclusion, the study recommended a comprehensive study to assess the implementation of the curriculum in Mechatronics at the Polytechnic to the needs of the industry in Malaysia. This is to ensure that the implementation plan in line with the direction of the Polytechnic Empowerment and Transformation based on the right track in meeting demand in a developed country by 2020.

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