THE DOMAINS OF INDUSTRIAL COMPETENCIES: POLYTECHNIC AND INDUSTRIES' PERSPECTIVE

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ABSTRACT

The significance of this study was to explore the domains of industrial competencies from perspective of polytechnic and TVET industry which applied in teaching and working process. The respondents of this study were selected among lecturers at polytechnic and the industry participants in northern region. Questionnaires were used to gain data which applicable for research with observation design. The questionnaire was segregated into two sets with different format of arrangements. The feedback was then analysed through descriptive method, which involves frequencies, percentages, mean and standard deviation. The study found that the six mean domains of industrial competencies which were integrated by the polytechnic lecturer during the teaching process and needed by industry in working process were professional knowledge, technology skill, information management skill, interpersonal & communication skill, thinking skill, and personal quality. The results provided evidence that both lecturers and industry participant agree on the importance on these six domains. The different perspective just on the level of important of that domains.

Keywords: Competency, Professional Knowledge, Technology Skill, Information Management Skill, Interpersonal & Communication Skill, Thinking Skill, Personal Quality.

1.0. Introduction

Technical Education and Vocational Training (TVET) have been established for more than three decades in the education system in Malaysia. The establishment of TVET institutions throughout the country is the government's efforts to introduce technical education and vocational training for young Malaysians to produce skilled workers. Workforce planning for the country are not only dependent on professionals, but also on the work force to be equipped with the knowledge and technical skills and vocational training to enhance the competitiveness of Malaysian workers in the global labor market. In Malaysia, the efforts to produce human capital to meet the TVET industrial needs are through TVET institutions especially polytechnic. The direction of the Ministry of Higher Education (MOHE) in promoting polytechnics has the goal of building a new capability of polytechnics to develop the nation's human resources in meeting the needs of the New Economic Model (MBE) which emphasizes on the capability of innovation and creativity. The effort is also to provide polytechnics to face various scenarios and future challenges in the changing and diversification needs of the TVET market. Such challenges and changes require the improvement of the TVET education approach in providing more relevant human capital and fulfilling the needs of the industry.

2.0. Literature Review

Human capital development is an effort to achieve cost savings and improve the performance of the industry. Schultz (1963) defined human capital as an important element for upgrading company performance and to improve productivity of employees and

sustainability to be more competitive. Theory of Human Capital (Schultz, 1963) is essentially from the theory of macroeconomic development discipline. Human capital theory approach is used by Becker (1993) in the education system which is referred to as the knowledge, expertise and skills acquired by a person through the medium of education and training. According to Amankwah & Swanzy, (2011) academic institutions and industry need to collaborate to provide the needed competences in building competences among students for the job market. Meanwhile Alam et al., (2010) in their research state that stakeholders such as industry and academic institutions therefore have a role to play in ensuring that the right competences are built among polytechnic students.

2.1 Competency

There were a lot of definition trying to explain the meaning of competency, however most of them were just attachment of terms. According to Chryssolouris, Mavrikios, & Mourtzis, (2013) competence is one capability to handle certain situations successfully or complete a job in terms of cognitive factors, intellectual and perceptual motor skills, affective factors, personality traits and social skills. In the context of this study, the domain of the competencies is based on technical and non-technical aspect which consist of six domains. The domains are shown in the figure 1 below:



Figure 1: Domains of Competency

2.1.1 Professional knowledge

Knowledge is an important aspect of improving development and productivity (Michaelis, Wagner, & Schweizer, 2015). According to Hanewald and Ng (2011), knowledge is formed after lecturers act to search, manage and process raw information and be converted into more meaningful information.

2.1.2 Technology skill

Technology is a combination of techniques, skills, methods and processes used in the production of a product or service. Technology is also a set of knowledge in selecting techniques, processes or can be incorporated into certain machines, computers, and devices where they can be operated by individuals without having to have detailed knowledge of how they work. Among the features in this technological skill are the ability to choose technology, to understand systems, to use technology on tasks, to solve equipment damage and to monitor and improve implementation (Rasul et al., 2012).

2.1.3 Information management skill

The study conducted by (Umar & Yusoff, 2014) shows that in Malaysia the instructors at educational institutions need to have the skills in information management which includes the basic efficiency of computer usage, the use of the internet as access and sharing of information, and the use of information to communicate.

2.1.4 Interpersonal & Communication Skill

Interpersonal communication occurs for a variety of reasons ie solving problems, solving conflict, sharing information, improving self-perception or fulfilling social needs such as loving and loving (Pearson, 2000).

2.1.5 Thinking Skill

Thinking skills are the skill or ability to use the mind to generate and generate unlimited ideas, variety, new, original, extraordinary, provocative, challenging, easy-tochange, and extendable to a wider and open idea (Piaw, 2010). Meanwhile, Mirzaei, Aaliyah, & Kashefi (2014) states that the thinking skills element that should be available to a lecturer is observation, communication, evaluation, decision making, and teamwork.

2.1.6 Personal Quality

Based on the context of this study, personal qualities are interpreted as a set of values and morals that are standard for individual, organizational and profession behavior or are known as ethics and professionalism.

3.0 Purpose of the study

This study is to explore the domains of industrial competencies that are important from perspective polytechnic and industry. While the research objectives to be achieved in this study were:

- (v) To identify the level of industrial competencies integrated by the lecturer of polytechnic.
- (vi) To identify the level of important of industrial competencies needed by the industry.

4.0 Research Method

4.1 Participants and Procedure

A descriptive method was used in this study, where samples were divided into two groups that is polytechnic lecturer and employer's industry in Malaysia. There are total numbers of 132 polytechnic lecturers and 124 employer's industry have been involved in this study. Data was analyzed by using the descriptive method, which involves frequencies, percentages, mean and standard deviation.

4.2 Instrument

A set of questionaire were employed by this survey. According to pilot study carried out before, credibility and value Alpha Cronbach is more than 0.6 has authenticated the adoption of this questionaire. There were 2 parts in questionaires which are part A and B. Part A was about their biodata and academic or carrier background, and part B was to survey the important of the six domains of industrial competencies. The questionnaire used 5 point Likert scale in this study refers to: 1 = very unagree, 2 = unagree, 3 = less agree; 4 = agree, 5 = very agree. In order to determine the reliability of the instrument, the reliability test were used. The reliability (Cronbach Alpha) of six domains in the industrial competencies has been tested. All the variables used in this study showed Cronbach Alpha values more than 0.6 indicating that the chosen item are consistent and reliable.

5.0 Result and Discussion

5.1 Respondent Profile

Table 1 shows, a total of 132 polytechnic lecturers involved in this study where a total of 53 lecturers (40.2%) were male and 79 lecturers (59.8%) were female. For working experience finding shows a total of 41 lecturers (31.1%) have a working experience below 5 years, 50 lecturers (37.9%) have 5 to 10 years, 31 lecturers (23.3%) have 11 to 15 years, and 10 lecturers (7.6%) have above 15 years.

Gender	Frequency	Frequncy Percentage (%)
Male	53	40.2%
Female	79	59.8%
Total	132	100%
Working experience	Frequency	Frequncy Percentage (%)
< 5 tahun	41	31.1%
5-10 tahun	50	37.9%
11-15 tahun	31	23.5%
> 15 tahun	10	7.6%
Total	132	100%

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Meanwhile, table 2 shows the finding from industry where a total of 124 participants were involved. A total of 49 participants (39.5%) were male and 75 participants (60.5%) were female. The findings on working experience shows a total of 39 respondents (31.5%) have a working experience below 3 years, 41 respondents (33.1%) have 3 to 6 years, 20 respondents (16.1%) have 7 to 10 years, and 24 respondents (19.4%) have above 10 years.

Gender	Frequency	Frequncy Percentage (%)
Male	49	39.5
Female	75	60.5
Total	124	100%
Working experience	Frequency	Frequncy Percentage (%)
< 3 tahun	39	31.5
3-6 tahun	41	33.1
7-10 tahun	20	16.1
>10 tahun	24	19.4
Total	124	100%

Table 2: Respondent profile (Participant of industry)

5.2 Level of Industrial Competencies from Polytechnic and Industrial Perspective

Table 3: Comparison of industrial competencies domains from polytechnic and industry perspective

Domain	Polytechnic		Industry	
	Mean	Level	Mean	Level
Professional knowledge	4.3106	3	4.3065	4
Technology skill	4.1439	6	4.4677	1
Information management skill	4.2727	5	4.2581	6
Thinking skill	4.3030	4	4.2823	5
Interpersonal & communication	4.3561	1	4.3468	2
Personal quality	4.3409	2	4.3226	3

As a whole, the study found that the level of average mean of the domains are high with all the values were above 4.00. Table 3 showed the mean of the six domains of industrial competencies among polytechnic lecturer and participant of industry. The analysis from polytechnic perspective showed that interpersonal & communication (M = 4.3561) is the highest mean values followed by personal quality (M = 4.3409), professional knowledge (M = 4.3106), thinking skill (M = 4.3030), information management skills (M = 4.2727), and technology skills (M = 4.1439).

Meanwhile, the analysis from industry perspective showed that technology skills (M = 4.4677) is the highest mean values followed by interpersonal & communication (M = 4.3468), personal quality (M = 4.3226), professional knowledge (M = 4.3065), thinking skill (M = 4.2823), and information management skills (M = 4.2581).

The results provided evidence that both lecturers and industry participant agree on the importance on these six domains. It is approved by Chryssolouris, Mavrikios, & Mourtzis, (2013) in their research where competence is one capability to handle certain situations successfully or complete a job in terms of cognitive factors, intellectual and perceptual motor skills, affective factors, personality traits and social skills.

This study also revealed a significant difference on technology skill domain. Technology skill emphasized by the industry has the highest value indicating that is one of the most important domain of industrial competencies. On the other hand, the lecturers from polytechnic shows their technology skill is just on lowest level. Lecturers should concentrate and concern on this issue and they should continue seek for assistance or further their knowledge as to deliver a better industrial competence to students.

Conclusion

In conclusion, industrial competences have become an important issue in the job market, for the students, learning providers, and the industries. This paper has outline the rank of the importance of industrial competences for the students and has been integrate in teaching and learning process in the classroom by the polytechnic lecturer. It also views of the domain industrial competences needed by the employer's industry in Malaysia. Lastly this paper highlights the difference of industrial competencies level among polytechnic lecturer compared to the industrial needs.

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