Employers' Perceptions and Expectation toward Engineering Graduates: A Study Case

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Abstract:- Rapid and drastic changes in economic growth nowadays are creating higher demands for employability skills in the workforce. Labour market becoming more competitive and depends on quality of knowledge and skills as the globalization come across in all industry. The employers have high expectations on fresh engineering graduates to perform in their organisation as soon as they are hired. Engineering employability skills are therefore necessary for Malaysia to remain competitive in global market. The study identified the perception and the expectation of employers on skills owned by engineering graduates in their work place. The finding indicates that the majority of those companies employing graduates have been satisfy with the knowledge and skills of the graduates they recruit. They expected for new engineers are very important to be equipped with relevant employability skills and abilities. Employers' expectation and perception play an important role in determining the employability skills needed.

Key-words: - Engineering graduates, perception, expectation, employers, and employability skills.

1 Introduction

The Malaysia Economy In Brief 2008, Department of Statistics, Malaysia, indicates in Macro Economic Indicators that the unemployment rate in first quarter of 2008 is 3.6% (398,000) which is 0.4% increased from 2007 (3.2% unemployment rate). The unemployment rate increased including graduate of the tertiary level. To put a stop on this, several studies have been conducted to find the factors of this increment and to find the solution to this problem. One of the factor is the graduates are not ready to enter the workforce. They are lack of employability skills needed by employers [4], lack of competencies or capabilities [7] and not equipped with the relevant skills [5].

The current economic challenges and globalisation are forcing employers in engineering sector to seek for competent engineers. Consequently, the graduates have to prepare themselves with skills desired by their future employers. Above and beyond good academic qualifications, employers also required their new engineers to be equipped with relevant capabilities, skills, abilities and personal qualities. According to Nurita report, the representatives in a workshop organized by the Economic Planning Unit in July 2004, had agreed that the graduates are "…well equipped with the technical skills such as in ICT, management, engineering and marketing but they lack in certain aspects such as ability to communicate, skills to solve problems and poor interpersonal skill"[9]. Furthermore, several researches in engineering education basically found out that the current educational system and practices in Malaysia unable to deliver the graduates fully equipped with employability or generic skills required by employers nowadays or in the near future [5][7][1][9].

Therefore, the aim of this study is to investigate the level of satisfactory of employers on skills owned by engineering graduates in their work place and the expectation of employers on the set of employability skills related to engineering sector for the future. It is a hope that this study will provide the relevant information for engineering graduates to build the awareness on employability skills and prepare themselves to enter the workforce.

Hopefully, the finding will help the students to enhance the skills, capabilities, abilities and personal qualities before they graduated and go for the job interview.

2 Literature Review

According to Mohammad [7], new and fresh engineering graduates these days confront with more "challenges and competitions" in getting employed compared to previous graduates. In addition, he emphasized that the excellent academic degrees alone are inadequate as employers are required potential engineers for "competencies and capabilities" in softskills since globalisation demands the companies to be more competitive in management system [7]. Economic recession and the trend towards globalisation have influenced the Malaysian employment system. In order to survive in the global market, employers began new approach to recruit new engineers. Most companies demand engineering graduates to owned sufficient skills and abilities to work immediately. This can be seen in their advertisement for vacancies. As a result of this factor, the number of unemployed graduates increased. Engineering graduates are required to possess the employability skills to help them practising their knowledge and technical skills effectively [7].

In Malaysia, engineering graduates have good basic engineering knowledge [8] and they are not lack of technical competency [9]. However, employers in Malaysia complaint on the graduate-level job applicants are lacking generic skills [9]. Employers and leading engineers agreed that local engineering graduates are lack of oral and written communication skills [3]. The study done by Hassan shows that there is an urgent need for engineering programmes to improve in all areas, especially in non-technical aspects of engineering education. In other words, the education programmes are recommended to enhance employability skills by emphasizing on improvements in the non-technical skills aspects amongst undergraduates [3].

The Employability Skills Framework developed by Hassan (2007) listed thirteen (13) most important generic skills acquired by the engineering graduates [3]. The skills are based on criteria emphasized for professional skills from the Accreditation of Engineering Programmes (EAC) Manual. The finding on engineering employability skills is summarised in Table 1 according to the importance of employability skills expected by employers.

3 Methodology

Questionnaires were delivered to thirsty (30) employers at various engineering industry in the Klang Valley area of Malaysia. However, the sample is limited to engineering employers in a limited geographical area of Malaysia. Among them, 23.8% are from Local company with annual sales turnover exceeding RM10 million to RM25 million, 23.6% from Local company with annual sales turnover RM25 million to RM100 million and the remaining 47.6% from Local companies with annual sales turnover exceeding RM100 million and multi national company. There are about 14.3% of respondent are in education industry, 9.5% are in transport services, Consulting practices, and Agriculture and Food industry. Meanwhile, 33.3% are in engineered materials, 4.8% are in energy and natural resources, and 19% are in Built Environment.

There are thirteen (13) skills listed adopted from EAC Manual and results from "The Future of Engineering Education In Malaysia, 2007" [3]. The employability skills comprise communication effectively, competent in application and practice, interpersonal or team working skills, engineering problem solving and decision making skills, apply knowledge of science and engineering principles, competent in specific engineering discipline, understand professional , social and ethical responsibilities, lifelong learning, engineering system approach, knowledge of contemporary issues, design and conduct experiments, competency in theoretical and research and entrepreneurial skills.

The survey sought to study the satisfactory of employers toward engineering graduates in their work place, and the level of important of skills and abilities in engineering graduates in future graduate recruits. The employers were asked to indicate their satisfactory on knowledge, skills and experience owned by engineering graduates in their work place, and how important they thought each of the knowledge, skills and experience that would be needed for future employment. Each item was measured using a five-point Likert scale representing different levels of satisfactory and levels of important. Finally, the collated data was analysed quantitatively using means and percentage analysis. The results are presented below in Table 2 and Table 3. For the purposes of the survey 'employability skills' was taken to mean the non-technical skills and abilities.

Table 1Engineering Employability Skills Developed by Ministry of Higher Education

No	Skills	Description
1	Communication effectively	The ability to present ideas with confident and effective through aural, oral and written modes, not only with engineers but also with the community at large
2	Competent in application and practice	The ability to use the techniques, skills, and modern engineering tools
3	Interpersonal or team working skills	The 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	Engineering problem solving and decision making skills	The ability to undertake problem identification, apply problem solving , formulation and solutions
5	Apply knowledge of science and engineering principles	The ability to acquire and apply knowledge of engineering fundamentals
6	Competent in specific engineering discipline	The ability to acquire in-depth technical competence in a specific engineering discipline
7	Understand professional , social and ethical responsibilities	The ability to understand the social , cultural, global and environmental responsibilities of a professional engineer, and commitment to professional and ethical responsibilities
8	Lifelong learning	The ability to recognize the need to undertake life long learning, and possessing / acquiring the capacity to do so
9	Engineering system approach	The ability to utilize a systems approach to design and evaluate operational performance
10	Design and conduct experiments	The ability to design and conduct experiments, as well as to analyse and interpret data.
11	Knowledge of contemporary issues	The ability to continue learning independently in the acquisition of new knowledge, skills and technologies. Nowadays, the use of information, communication and computing technologies are very essential in the knowledge-based era.
12	Competency in theoretical and research	Having the competency in theoretical and research engineering.
13	Entrepreneurial skills	Having basic entrepreneurial skills.

Sources: “The Future of Engineering Education In Malaysia”(2007); EAC Manual (2003); ABET, USA(1998)

Table 2 Level of Satisfactory Perceived By Employers.

No	Skill	Mean	Level of Satisfactory
a)	Having in-depth technical competence in a specific engineering discipline.	4.3	Satisfactory
b)	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.	4.2	Satisfactory
c)	Ability to communicate effectively, not only with engineers but also with the community at large.	4.0	Satisfactory
d)	Having competency in engineering application and orientation.	4.0	Satisfactory
e)	Ability to acquire and apply knowledge of engineering fundamentals	4.0	Satisfactory
f)	Ability to undertake problem identification, formulation and solution.	3.9	Satisfactory
g)	Having the competency in theoretical and research engineering.	3.9	Satisfactory
h)	Having social awareness, cultural, global and environmental responsibilities and ethics of a professional engineer and the need for sustainable development.	3.6	Satisfactory
i)	Ability to utilise a systems approach to design and evaluate operational performance.	3.5	Satisfactory
j)	Recognising the need to undertake lifelong learning, and possessing/acquiring the capacity to do so.	3.5	Satisfactory
k)	Ability to design and conduct experiments, as well as to analyse and interpret data.	3.4	Quite Satisfactory
l)	Having the knowledge of contemporary issues.	3.2	Quite Satisfactory
m)	Having basic entrepreneurial skills.	2.9	Quite Satisfactory

Table 3 Employers' Expectations Towards Engineering Graduates

No	Skill	Mean	Level of Important
a)	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.	4.4	Important
b)	Ability to communicate effectively, not only with engineers but also with the community at large	4.3	Important
c)	Ability to undertake problem identification, formulation and solution	4.2	Important
d)	Ability to acquire and apply knowledge of engineering fundamentals..	4.2	Important
e)	Having competency in engineering application and orientation.	4.0	Important
f)	Ability to utilise a systems approach to design and evaluate operational performance.	3.9	Important
g)	Recognising the need to undertake lifelong learning, and possessing/acquiring the capacity to do so.	3.9	Important
h)	Ability to design and conduct experiments, as well as to analyse and interpret data.	3.9	Important
i)	Having the competency in theoretical and research engineering.	3.7	Important
j)	Having in-depth technical competence in a specific engineering discipline.	3.7	Important
k)	Having social awareness, cultural, global and environmental responsibilities and ethics of a professional engineer and the need for sustainable development.	3.7	Important
l)	Having the knowledge of contemporary issues.	3.5	Important
m)	Having basic entrepreneurial skills.	3.2	Quite Important

4 Results

The result shows some significant gap exists between the skills actually possessed by employee and the skills are thought to be important by employer. The most important skills but most lacking skills are teamwork, communication, and problem-solving. In addition to these are skills in lifelong learning, apply basic knowledge, understand professional, social and ethical responsibilities and etc. Figure 1 shows the differences between level of satisfaction and level of important for each skill given by the employers (respondent). It shows that the 'ability to communicate effectively' and 'having competency in engineering application and orientation' are still below expectation. Employers still found that graduates are lacking of these skills and they are not satisfied with it. However, employers are very happy with the ability in technical competence in a specific engineering discipline and competency in theoretical and research engineering. Meaning that, the graduates are not lacking in technical skills.

4.1 Employers' Perception towards Engineering Graduates

The assessment of employers on knowledge, skills and experience owned by engineering graduates in their workplace indicate that 77% were satisfied with skills of their organisation's graduate employees – i.e. the knowledge and skills associated with engineering skills. 23% were dissatisfied.

Based on the data analysis, the mean scores of the skills owned by new engineer in relation to the employer's level of satisfactory were above 3.5, indicating that they were satisfied with the skills possessed by engineering graduates. Table 2 presents results of the mean scores for employers' level of satisfactory on skills owned by their new engineers. There are three (3) skills that fall under the 'Quite Satisfactory' levels of satisfactory: ability to design and conduct experiments, as well as to analyse and interpret data, having the knowledge of contemporary issues, and having basic entrepreneurial skills. Meanwhile, employers were satisfied of the other ten skills. As a whole, the mean scores suggest that only 77% of the engineering graduates were practicing skills as needed and satisfied by employers.

4.2 Employers' Expectations towards Engineering Graduates

On the other hand, the mean scores of the employers' expectations towards engineering graduates were above 3.5 except 'having basic entrepreneurial skills'. This indicates that employers thought the knowledge, skills and experience were important for future employment to hire new engineers. They expected 92% of relevant employability skills and abilities listed are very important for graduated to be equipped with.

5 Discussion And Conclusion

The survey invited views on the desirability of 13 different employability skills based on EAC Manual. The statistical results indicate that employer's perception and expectation on skill owned by graduates is moderate. At the same time, the results discussed in this paper are substantial for engineering graduates since employers' expectation are very essential since they are the one select the new employees. An important point to note is that employers expectation should be taken into account as part of the graduates decision-making process, so that it has an impact on "their job-hunting" performance. The results provided graduates with valuable insight as they effort towards getting employed with competitive company. The study represents a useful source of information for undergraduate students planning to find a job, and for higher-education managing undergraduate programs to produce high skilled graduate.

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