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Competency of Civil Engineering Students Undergone Industrial Training: Supervisors' Perspectives

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Abstract

In Malaysia, the engineering diploma programs in the public universities require the approval of the Ministry of Higher Education (MOHE) and accreditation by the Malaysian Qualification Agency (MQA). The graduates are normally employed as technical assistants in the various engineering fields. However, not all the engineering programs are designed with the industrial training component. Recently, in order to enhance employability of the graduates, industrial training course was introduced as one of the compulsory requirements in the diploma program of Faculty of Civil Engineering, Universiti Teknologi MARA (UiTM). The objective of the training is to expose UiTM students to the competency, knowledge and skills needed to succeed at the workplace. By undergoing industrial training, they will be able to relate the theory that they learnt and applied them practically. This study sought to determine the perceived level of competency of UiTM students by the industrial and faculty supervisors during the industrial training.

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1. Introduction

The increasing rate of unemployed graduates has become a great concern lately. The Ministry of Higher Education (MOHE), Malaysia has placed graduate employability an important agenda under the National Education

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Strategic Plan where it is emphasized that all the graduates need to have additional skills to complement their knowledge in order to be employed after their graduation. It was reported recently that up to 40% of public university graduates in Malaysia were jobless or in mismatched occupations (Ji, 2013). According to the Department of Statistics Malaysia (Department of Statistics, 2011) the unemployment rate in Malaysia had increased from 3.2% in 2007 to 3.7% in 2009. Meanwhile, based on the advertisement and job placement in the newspapers, the job vacancies are actually increasing year by year. This shows that unemployment happened not because of lack of job opportunities. One of the factors contributed to the unemployment problems among Malaysian graduates was the low quality of the graduates (Ismail et al.).

Graduates categorized as 'low quality' are those who are not readily prepared themselves for the job market, poor technical skills, lack of communication skills and lack of cognitive skills (Mahathir, 2007; Economic Planning Unit, 2007). A survey on the employers' perspective and needs for employment in the UK found out that teamwork, thinking skills, communication skills, business awareness, leadership and self-management and technology are the important criteria for the employment for the graduates (CBI, 2009). The findings were also similar to the requirements of Malaysian employers (Bardan, 2009). Many graduates failed to find employment due to their lack of soft skills (Hii, 2007).

The element of soft skills and employability skills in the curriculum for each field of study in educational institutions are important to improve the quality of graduates. One of the ways is through the industrial training or industrial attachment. Industrial training or attachment refers to formal placement of students in the workplace to facilitate the achievement of specific learning outcomes that would potentially lead to their employment on completion of a training program. The industrial training involves training providers and industries forming partnerships to offer learning opportunity in the workplace so that the students can gain practical experience. The term industrial training in some countries may be called on-the-job learning (e.g. Finland), return or back to industry program (e.g. Australia) (International Handbook of Education for the Changing World of Work). Industry-attached forms of training include industrial training at private, government or non-government organizations, teaching practice, project based research and legal attachment. All these forms of training are essential to provide the environment for students to experience and test their theory and knowledge that they have learnt in university with the work-based issues (Dodge & McKeough, 2003). Students should be exposed to the real life work environments and their related professional practices and organizational cultures so as to acquire work experience and applications on the job, thereby supplementing disciplinary knowledge in real business practices (Shariff et al., 2006). Thus, it is important for the training providers to determine whether the industrial training program is effective and meet its objectives with respect to learning and skills development in the trainees towards future job employability

2. Methodology

In the present study, civil engineering students from UiTM Sarawak went for their industrial training from April 14 to June 6, 2014 or for a period of at least 8 weeks to fulfill the requirements of the revised curriculum (March 2014) of a six-semester diploma program. The industrial training course was only opened for the current semester 4 and 5 students (final semester students were exempted). The students were attached to various organizations and companies in Sabah and Sarawak selected by them. A briefing was arranged by the industrial training coordinator from the faculty to explain the rules and regulations to the students before the start of their training. During the training, the students were supervised by the employers (industrial supervisors) who guided them and planned their training programs. Each student must record in detail his or her daily activities into a logbook to be checked by the industrial supervisor. Before the training ended, visits to the organizations were arranged by appointed faculty supervisors to assess the competency of the students during their training. Each student was interviewed by the faculty supervisors and their logbooks were checked. Both industrial and faculty supervisors were asked to evaluate the competency of the students during the industrial training using these criteria: Attendance; Punctuality and attitude; Quality of work; Learning capability; Application of knowledge; Co-operation; Discussion with supervisor/co-workers; Communication ability; Oral and written presentation skills; Organization skills; Scope of work and relate to theoretical knowledge; and Safety. In the evaluation form, competency of each student was assessed using a five-point Likert scale: 5 – Excellent; 4 – Good; 3 – Satisfactory; 2 – Average; and 1 - Weak.

3. Results and discussion

87 students at UiTM Sarawak registered for the industrial training course, ECM375 made compulsory for the first time under the revised curriculum of Diploma in Civil Engineering program. Table 1 shows the details of the students' profile. The demographic profile of students was categorized based on the information obtained from the evaluation form (UiTM.FKA.LI-10) according to gender, semester, type of organisation and evaluation period. 48 out of 87 or 55% were male students. Second year students were the highest number of students register for industrial training, which was 60 out of 87 or 69%. Meanwhile, mere 31% were final year students. Based on the Table 1, more than half students undergone industrial training in government sectors, example Public Work Department, Department of Irrigation and Drainage and Kota Kinabalu City Hall. Meanwhile, students who undergone training with developer, contractor and consultant were 7%, 24% and 15% respectively.

Table 1. Demographic profile of students

	Percentage (%)
Gender:	
Male	55
Female	45
Current semester:	
4	69
5	31
Current CGPA:	
≤ 1.99	2.3
2.00 - 2.49	18.4
2.50 - 2.99	35.6
3.00 - 3.49	31.0
≥ 3.50	12.6
Type of organisation:	
Government agencies/Government-linked companies	54
Developer	7
Contractor	24
Consultant	15
Others	0
Evaluation period (Industrial supervisor):	
Weeks 1-2	3.4
Weeks 3-4	0
Weeks 5-6	52.9
Weeks 7-8	43.7
Evaluation period (faculty supervisor):	
Weeks 1-2	0.0
Weeks 3-4	0.0
Weeks 5-6	34.5
Weeks 7-8	65.5

Meanwhile, information on the students' cumulative grade point average (CGPA) was obtained from the Integrated Student Information System (ISIS), accessible only through intranet by UiTM staff. The mean scores of competency of the students according to the 12 criteria as perceived by both faculty and industrial supervisors during the industrial training are presented in Fig. 1. Competency in the evaluation refers to perception of the student capable of doing or what the student knows and can do by the student's supervisor. It is noted that the real performance of the students may not be portrayed in a short period of time.

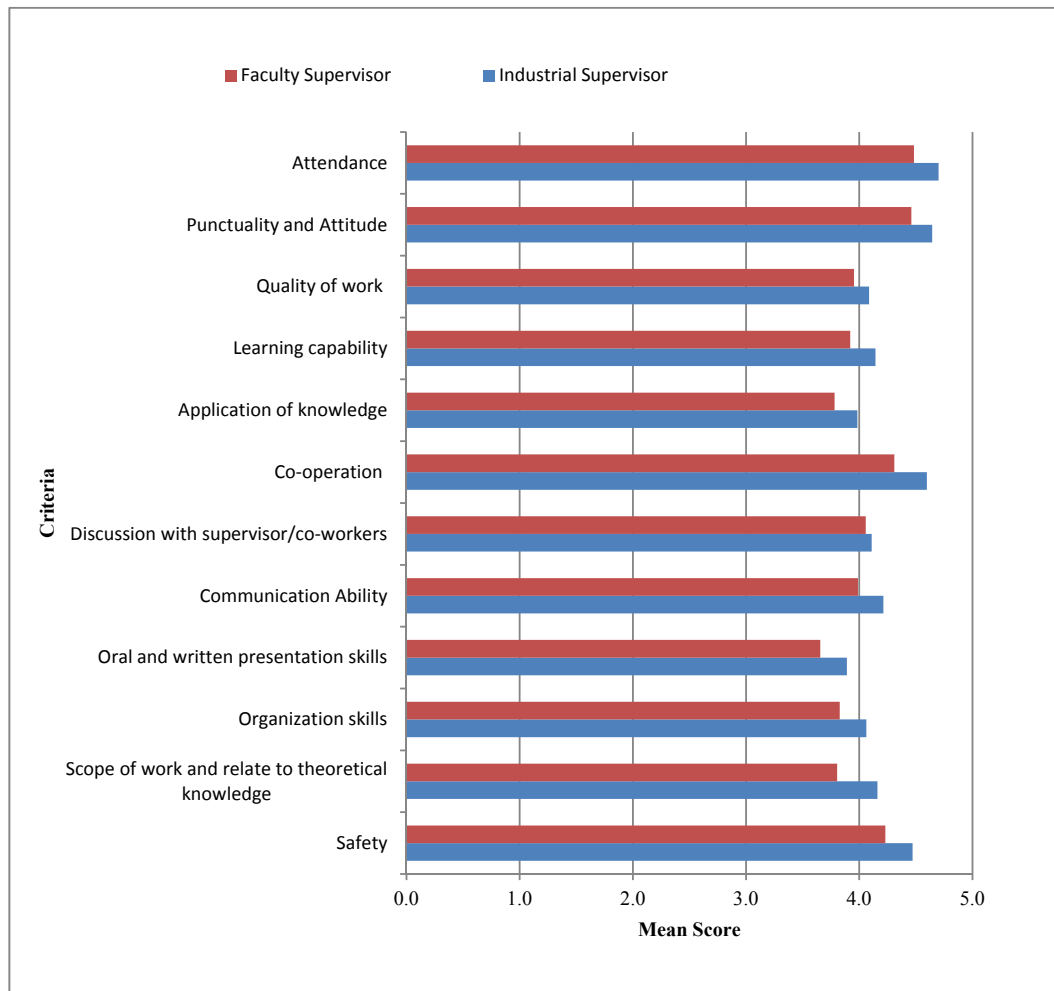


Fig.1. Perceived students' competency: comparison between industrial and faculty supervisors

The results show that the industrial supervisors' mean scores are greater than the faculty supervisors' in all the criteria as shown in Fig. 1. As can be seen the difference in mean score between the faculty and industrial supervisors for each criteria is not very significant (less than 0.5). The highest mean score for both faculty and industry supervisors comes from attendance (and punctuality and attitude by faculty supervisors). The high score for students' attendance is expected as the students have been informed before the beginning of their training that if their attendance is not satisfactory they could fail the course. For co-operation, the students also achieved mean score higher than 4.0 which indicates that the students were always cooperate to their colleagues such as engineers, assistant engineers and as well as general workers.

In addition, both supervisors agreed that safety among the students was high greater than 4.0. This shows that, the students were aware of the importance of safety at the construction site, for instance wearing the Personal Protective Equipment (PPE) and also safety requirements. Both faculty and industrial supervisors show lowest mean score for oral and written presentation skills. This infers that the students still need to put in more effort to improve their presentation skills. Application of knowledge among the students was also perceived less than 4.0 for both industrial and faculty supervisors. This shows that the ability of students to apply knowledge at workplace or in real situation from what they have learnt in class is still moderate. Besides that, there is also room for improvement in other criteria such as students' organizational skills and quality of work.

4. Conclusions

The findings show that the students' competency during their industrial training with respect to the 12 criteria evaluated in this study has been positively rated by both faculty and industrial supervisors. Overall, the students' attendance, punctuality and attitude, co-operation and safety were highly perceived by the industrial supervisors. The criteria that both faculty and industrial supervisors perceived the students should further improve were their oral and written presentation skills.

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