JBMES

Journal of Business Management and Economic Studies
Volume No 2, Issue 2, 2017

An Evaluation of Satisfaction on Industrial Training among Electrical Engineering Students

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Abstract

The main purpose of industrial training programme is to expose the students to real working environment and learn how to apply the theoretical concept into real technical job. Therefore, students who are involved in this programme will acquire knowledge and skill to explore and learn various working practices in the aspect of technology, management, planning, problem solving, social and communication skill. Upon completion of the programme, students are made compulsory to complete a survey related to their satisfactory level of the training. This paper reports an empirical

evaluation study of subjective satisfaction on Industrial Training Programme among engineering students. The data was collected using a set of survey questionnaire which comprised of three main parts; satisfaction on organization, satisfaction on job exposure and overall satisfaction. The survey was aimed to collect the feedback from students in terms of job exposure, organization satisfaction and achievement satisfaction. The statistical analysis method used were Descriptive analysis and Paired sample t-test. Data analysis showed there was no different in statistical significant in terms of satisfaction to the organization, type of job exposure and satisfaction to the overall achievement for both male and female. These results could be used for better industrial training management and syllabus review process.

Key Words: Social-science, Industrial training, Users' satisfaction, Empirical analysis, Higher education.

INTRODUCTION

At present, higher education institutes are showing concerns about the quality of learning and the courses offered to produce graduates who could meet the expected requirement of the job market. It is the same situation with Universiti Teknologi MARA where there is no exception in the realization of technological achievement towards globalization challenges. To produce competitive graduates, curriculum development is very important whereas the students should acquire the best learning process and achievement. Thus, FKE UiTM has included industrial training course into its Curriculum for Diploma in Electrical Engineering program. Industrial training program is designed to equip students with the knowledge and skills and successfully apply the theory to the real working environment. This is because the challenges and issues of their work can be very real. There are many issues and challenges that they confronted beginning at the search for training placement until the end of the training. These was discussed by Pillai, S., and Yusoff, M. (2007) in which the study found that students confronted several challenges for example there were only small number of interns who were offered internship in a company since the opportunity was found to be limited, short training period and etc. Issues and challenges like this is what that they get to see when they graduate and actually start looking for a job. Each process has encouraged students to become more aggressive, proactive and become competitive to achieve the goals of the programs that they are undergoing.

In establishing the quality of graduates, industry training program has assisted to improve students' credibility to be a professional employee in the engineering field. In the research study by Kingsley. K. and Niroshani. P.(2015) and Sahrir, M. S et al (2016), the study found that the industrial training program can develop self-confidence, execute problem solving activities, develop social interaction skills and aspire future education and career, essentially improved soft skills and increased their work-place literacy and well-being. The objective of industrial training is to adapt the technical skills in the use of software, tools and equipment for electrical engineering job scope. In addition, industrial training is also to focus on real industrial engineering practices and knowledge based on scope of work at the organization. Moreover, industrial training is also to apply work efficiently with the values of work with colleagues and superiors for a group project or assignment based on work procedures and/or work instruction. There are some steps in the industrial training program that have been provided by faculty to evaluate and analyze the results of the training industry. Therefore, this study focuses on the perception of students on industrial training program that they went through for eight weeks.

Industrial training program has helped establish a positive value in students regardless of each job and task that they are involved with (Omar, M. Z et al., 2008; Karim, Z. et al., 2007). The values of industrial training has been much discussed in previous study such as by Kingsley. K. and Niroshani. P. (2015), Eugene. O., et al.,(2014), Sahrir, M. S et al. (2016), Matamande, W., et al., (2013), Karim, Z. A.et al. (2007), Sahrir, M. S et al (2016) studied the satisfaction level of industrial training programme among Arabic

language student. The study shows high score in increasing self-confidence, improving their knowledge and teamwork, preparing them well to work in industry, and gaining the experience to set up their business in the future. Madurapperuma, M. W (2015), had analyzed the perception of internship programme among accounting students. However, there are still not many researches done on perception and satisfaction of students who have undergone training in electrical industry, particularly engineering school in Malaysia. In addition, many people have the perception that the field of engineering is only suitable for men. This issue is still not being reviewed. Therefore, this study focuses on the significant difference between male and female engineering students towards the perception and satisfaction in the industrial training.

RESEARCH METHODOLOGY

The industrial training programme for Diploma students at the Faculty of Electrical Engineering (FKE), Universiti Teknologi MARA (UiTM) Pulau Pinang is carried out for the duration of eight weeks after the students have completed four full time academic semester. The course carried out four credit hours and it is compulsory to complete their Diploma and pass for graduation. This is a new course in curriculum planning for the Diploma programme at FKE, UiTM Pulau Pinang. First batch of students were completed their training on 18th April 2016 until 10th June 2016. They were placed at various organization including government and private sectors.

There are several survey methods that can be used to collect data. Among these are distributed structured questionnaire and semi-structured interview (Kingsley. K. and Niroshani. P., 2015). In this study, a questionnaire method was used to collect the data which consists of three parts of survey. They are subjective satisfaction, type of exposure and overall achievement to the industrial training programme that they have undergone. All parts of survey were taken by the Electrical Engineering students which included three specialization programme namely; electrical–power, electrical–electronic and electrical–instrumentation. This survey involved 116 students as respondents to give their feedback for overall industrial training programme that they have successfully completed.

The survey data was collected and completely analysed using SPSS and Microsoft Office Excel to minimize human error in calculation of data. Likert-type scale is the most widely used approach in research study which involved questionnaire (Sahrir, M. S et al.,2016). For this study, the 5-point Likert Scale was used to design this survey to obtain respondents' perception. It is also to determine whether the students' perception gave a positive or negative perception (Kingsley. K. and Niroshani. P., 2015). The respondents were asked to choose a value from 1 to 5 provided in the survey. The interpretation of each indicator is point '1' that represents strongly disagree, point '2' to show disagree, point '3' to indicate neutral, point '4' is agree to satisfy and point '5' for strongly agree to satisfy. Point 1 being the lowest and point '5' is the highest point of satisfaction. In addition, point '1' and '2' can be categorized as not agree meanwhile point '3' and '4' as agree part. Point '3' as neutral satisfaction. For this survey, the Likert

scale was selected because of a few factors where are easy to construct and the question ease to read and complete for respondents.

All respondents were given the survey questionnaires to be completed after finishing their training. The questionnaire was sent via Google Form in order to provide the students with easy access to the survey form. The summary for all of the questionnaires are as follow:

1. Satisfaction towards the organization - measure the level of satisfaction in terms of suitability, benefit, work prospect that student has been undergoing.
2. Satisfaction towards the job exposure – measure the level of satisfaction to the task and job. The type of exposure includes design, analysis, outdoor work, consultation and administration.
3. Satisfaction towards the overall achievement – measure the level of satisfaction towards the overall training, task and job in terms of fulfilling the objective, the expectation, and challenges.

The main part of this study is to observe the comparison in satisfaction towards the industrial training programme between male and female. Therefore, the data collection was analysed according to two types of variables; the independent variables and dependent variables. The independent variables consist of male and female while dependent variable is satisfaction with the organization, the job exposure and with the overall achievement. All dependents variables were analysed in order to find the level of statistic significant for both independent variables. The evaluation includes the descriptive analysis and paired sample t-test for all dependent variables. From the variables studied, the null hypothesis for this study are as follows:

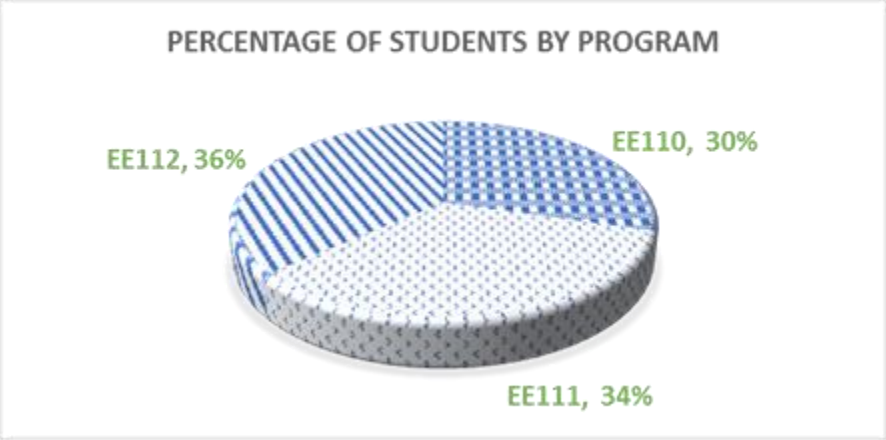
- Hypothesis 1: No difference between male and female in subjective satisfaction to the organization (H1)
- Hypothesis 2: No difference between male and female in subjective satisfaction to the job exposure (H2)
- Hypothesis 3: No difference between male and female in subjective satisfaction to the overall achievement (H3)

RESULT AND DISCUSSION

Demographic background

The total number of respondents that have completed their survey response is 116 students. Figure 1 shows the percentage of students by program. The percentages stand at 36%, 30% and 34% for EE112 (Electrical – power), EE110 (Electrical – Instrumentation) and EE111 (Electrical – electronics) respectively.

Figure 1. Percentage of students by program



Descriptive analysis

In this study, descriptive analysis is used to summarize of observations the data collection. Table 1, Table 2 and Table 3 show the value of mean and standard deviation for all questions elements according to the satisfaction category. From Table 1, overall mean value for satisfaction towards the organization is 4.1580 which is obtained from three categories of question elements. The mean value is 4.1379, 4.2328 and 4.1034 for the suitability, benefit and prospect of work respectively. The overall mean value indicated that students are satisfied with the organization in terms of suitability, benefit and work prospect. The standard deviation is used to quantify the data variation from a set of data collection. Overall value of standard deviation is 0.7470 that indicates the data value is closer to the mean. This suggested that, the industrial training placement has met the training outcome the students should acquire after undergoing the industrial training programme.

Table 1. Mean and standard deviation of satisfaction to the organization

	Mean	Std. Deviation
Suitability	4.1379	0.80105
Benefit	4.2328	0.68977
Work Prospect	4.1034	0.75041
Overall	4.1580	0.7470

The mean and standard deviation value of satisfaction to the job exposure is shown in Table 2. The five types of job exposure namely design, analysis, outdoor work, administration and consultation. Outdoor work shows the highest mean value of 4.1207 and followed by the second highest; 3.8966, for consultation job exposure. Therefore, it is found that, most of the students have involved in the outdoor work such as maintenance, repair and upgrade. This means that the job or assignment is found to be suitable for Diploma students in Electrical Engineering. Meanwhile, all standard deviation values are low where the data dispersion is evidently near to the mean value.

Table 2. Mean and standard deviation of satisfaction to the job exposure

	Mean	Std. Deviation
Design	3.6379	1.00777
Analysis	3.8448	0.81937
Outdoor work	4.1207	0.94322
Administration	3.7328	0.88816
Consultation	3.8966	0.87853

Table 3. Mean and standard deviation of satisfaction to the overall achievement

	Mean	Std. Deviation
Challenging	4.0690	0.82065
Fulfil objective	4.0517	0.81128
Fulfil expectation	3.8534	0.88715

Table 3 shows the value of satisfaction to the overall achievement in mean and standard deviation. Overall achievement has three categories namely challenging job or task, fulfill the objective and fulfill the expectation. Most of the students expressed their opinion that the training programme was challenging as can be seen from the highest mean value and most of them have achieved objective of the training. The mean value for fulfill the expectation also indicated that students are satisfied with the training programme. The descriptive analysis helps to measure the distribution of data collection for each element of questions. Overall data analysis has shown that students are satisfied and successful in their industrial training programme.

Subjective satisfaction evaluation

The satisfactory level data collection was gathered from the survey questions required for students to complete after the industrial training programme ended. They were given a set of questionnaire, part A to show their satisfactory level to the organization where students have to attend for the training, part B to learn about their satisfaction towards the type of job exposure and part C to collect the satisfaction analysis for overall achievement of industrial training.

Table 4. Descriptive evaluation of subjective satisfaction between male and female

		Mean	N	Std. Deviation
Overall achievement	Male	3.9540	58	0.80313
	Female	3.8793	58	0.79398
Job exposure	Male	3.7862	58	0.70672
	Female	3.7621	58	0.62851
Organization	Male	4.0345	58	0.82052
	Female	4.2126	58	0.62345

Table 5. Paired Sample T-test for Subjective Satisfaction between male and female students

		Mean	Std. Deviation	t	df	Sig. (2-tailed)
Organization	Male - Female	-.17816	1.01493	-1.337	57	0.187
Job exposure	Male - Female	.02414	0.83442	0.220	57	0.826
Overall achievement	Male - Female	.07471	1.05417	0.540	57	0.591

The Cronbach's Alpha coefficient is commonly used to demonstrate the reliability of the survey question and scale. The reliability value is considered reliable when the value is more than 0.7. So, the Cronbach's Alpha has been used to assess the reliability of the survey question. The overall value of α = 0.927 indicates that subjective satisfaction to the overall survey question was highly reliable for male. Meanwhile, female feedback in subjective satisfaction for overall survey question also shows high reliability with the □ = 0.898. The Likert-type scale with five points was used to measure the subjective satisfaction and was rated by students. Score 1 indicates negative perception while score 5 demonstrate positive perception. The survey questionnaire has 11 questions that consist of three part; satisfaction with the organization, satisfaction with the job exposure and satisfaction with the overall achievement. Table 4 shows the collection score for both male and female are almost equal. This means that both male and female students have positive perception to the industrial training. Further statistical analysis was conducted to determine the significant difference in subjective satisfaction for male and female score to the industrial training perception. From the results of normality testing, the suitable technique to test the difference of statistical significant is paired samples t-test. Table 5 shows that there was significant difference in subjective satisfaction between male and female for all parts satisfaction category. The significant difference value is 0.187, 0.826 and 0.591 for satisfaction to the organization, job exposure and overall achievement respectively. Because of that, the null hypothesis (H1, H2 and H3) are accepted since significance level is more than 0.05.

DISCUSSION AND CONCLUSION

Overall evaluation shows that no difference significant level between male and female. Table in previous section shows that industrial training programme indicates highly satisfaction for both respondent's category, male and female (Table 4 and Table 5). This study focuses on empirical evaluation which involves several variables of satisfaction in terms of organization, type of job exposure and overall achievement. The evaluation involves descriptive analysis and subjective satisfaction for all parts. The evaluation session includes 116 respondents which just completed their industrial training programme. The survey process has been successfully completed within two weeks after industrial training end. The study shows significant different in statistical between male and female for three parts of satisfaction; satisfaction to the organization,

type of job exposure and overall achievement. Hypothesis 1 (H1), Hypothesis 2 (H2) and Hypothesis 3 (H3) are accepted since value of Asymp. Sig. (2-tailed) were 0.187, 0.826 and 0.591 for all hypotheses respectively. All Asymp. Sig. (2-tailed) level is more than 0.05. Therefore, all parts show that male and female has same level of credibility, ability, perception to the technical job (hands on task/assignment) in Electrical Engineering field. In conclusion, industrial training programme in electrical engineering field contributed the same strength and superiority for male and female students.

ACKNOWLEDGEMENT

Thanks to Universiti Teknologi MARA Cawangan Pulau Pinang, throughout the financial supportive of this study.

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