

## Industrial Training of Students in Plantations

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### ABSTRACT

An analysis of the employers' assessment of students' performance and students' evaluation on an 8-week training in the plantation from 2001 to 2008, as a partial fulfillment for the Diploma of Plantation and Industrial Management from Universiti Teknologi MARA was conducted in Sarawak. More than 80% of the students obtained ratings of good to excellent in three determinants: Mental Aptitude, Interpersonal Skills and Responsibility and 76% in Job Competency. Although there was no significant difference between genders based on t-test analysis, the male students outperformed in all four determinants. There were significant differences among the seniority of the students following an improved trend from Year 1 to Year 2 but declined at Year 3 based on ANOVA on three determinants: Mental Aptitude, Responsibility and in Job Competency and no significant difference in Interpersonal skill. From the students' evaluation conducted in 2008, 79 % of students rated themselves as good to excellent in Mental Aptitude, 58 % Job Competencies, 73 % in Interpersonal Skills and 72 % Responsibilities. Generally the male students rated themselves lower in all the determinants as compared to the female students. The comparisons between employers' assessment and students' evaluation for 2008 showed significance in the ratings for four determinants. However, the associations as determined by Pearson's Correlation were not significant, showing a low inverse relationship. Over 84 % of the students rated the industrial training had provided motivation for them to continue learning as good to excellent. The number of satisfied statements and dissatisfied statements identified using Critical Incident Technique from the Students' Report totaled to 43 making up of 23 satisfied and 31 dissatisfied. Suggestions for improvement were mainly in the area of their welfare with respect to accommodation facilities and allowances.

**Keywords:** *Industrial Training, Employers' Assessment, Students' Evaluation, Mental Aptitude, Job Competency, Interpersonal Skills, Responsibility*

## INTRODUCTION

As the work environment becomes increasingly complex, classroom educational approach is not sufficient to train students effectively for the changing demands of the workplace. In this respect, the objectives of an 8 weeks' compulsory industrial training by Universiti Teknologi MARA (UiTM) students pursuing Diploma of Plantation and Industrial Management are to enable them to be exposed to the agricultural industry in order to adapt themselves much earlier to the actual job situations and the latest development in the plantation technology and management. This includes assessment by the employers which increases the significance of practical work and helps the students approach work more earnestly and critically. The purpose of this paper is to analyse the employers' assessment of students' performance and students' evaluation in industrial training as a partial fulfillment for the Diploma of Plantation and Industrial Management of UiTM.

## LITERATURE REVIEW

Graduates who are starting their careers face many requirements that include soft skills and knowledge of business (Becker, 2006). According to a report presented to the National Committee of Inquiry into Higher Education (NICHE, 1997), consultations with employers showed that employers want graduates to have a wide range of skills, such as those personal and cognitive capabilities that people use to carry out in a wide range of tasks and activities. Therefore education and training must be viewed as an integral whole as employers certainly seemed to have a long list of demands in addition to good grades in core technical subjects (Becker, 2006). Harvey and Green (1964) state that employers expect graduates to exhibit a wide range of attributes in which there is growing evidence in which academicians also agree in principle that graduates should be able to demonstrate a number of skills and abilities other than the acquisition of a body of knowledge and theory. Industrial training or practical work involves in learning-by-doing. It provides opportunities for students to enhance and apply what they have learned in their academic programme. Harris, et al. (2007) listed that the benefits of industrial training are that it encourages students to develop; it allows feedback to be given so that students can improve; it motivates students to learn from their experience in industry; students are encouraged to reflect on their work and how it relates to academic studies and finally student's achievements can gain formal recognition. According to Lumen (2001), three criteria desired by employers are abilities, attributes and qualifications. Abilities are talents or general skills that an individual has (e.g. work effectively in teams or communicate effectively); Attributes are personality traits or qualities that an individual has (e.g. flexibility and creativity) and Qualifications are the specific skills, degrees, certifications or prior experiences that an individual has that are related to their job responsibilities.

## MATERIALS AND METHODS

The completed evaluation reports of a "Practical Training Evaluation Report by the Employers" on students pursuing Diploma of Plantation and Industrial Management were obtained for a period of five years from 2001 to 2008, which excluded 2005. The completed

assessment forms by the employers who were placement providers for industrial training were analysed based on the four determinants: Mental Aptitude, Job Competency, Interpersonal Skills and Responsibility. These were examined according to the five rating scheme; 1: excellent, 2: good, 3: satisfactory, 4: moderate and 5: poor. The students' evaluation, based on a questionnaire adapted from the Bowling Green State University, Ohio, USA was conducted on all the DPIM students after they returned from their Industrial Trainings during the April – June 2008 semester Break. A total number of 14 questions contained in the questionnaire were classified into the same four determinants as in the employers' assessment. A comparison between employers' assessment and students' evaluation were also conducted. The Critical Incident Technique (CIT) was used to capture satisfied and dissatisfied statements experienced personally in the field of activity as recorded in their reports. SPSS software was used for the statistical analyses.

## RESULTS AND DISCUSSION

### Profile of the Students

A total of 140 students were recorded from this evaluation study, consisting of 92 males and 48 females who underwent industrial training from 2001 to 2008 excluding 2005 (Figure 1).

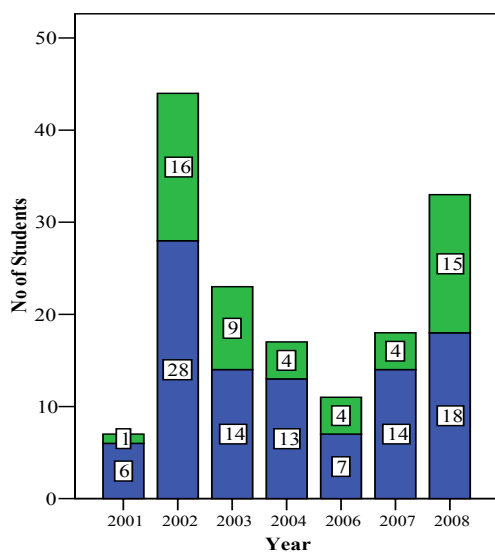


Figure 1. Total Number of Students in Industrial Training

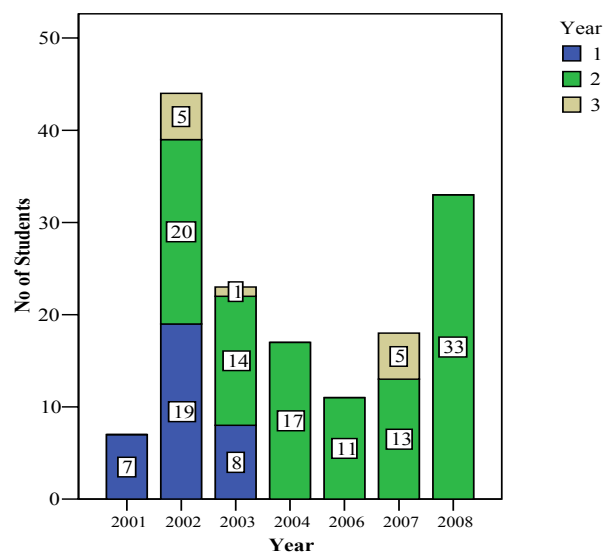


Figure 2. Category of Students in Industrial Training

Majority of the students were Year Two students (Figure 2). From 2004, onwards, Year One students were trained on the UiTM Farm and at the Landscape Unit of the University. There was also a change in the academic calendar of UiTM from 2004 onwards when the

semester break in the middle of the year was extended providing the opportunity to the students to go on training for a continuous two months' period.

### Employers' Assessment

Statistical analyses using t-test on the four determinants of performance: Mental Aptitude, Job Competency, Interpersonal Skills and Responsibility rated as good did not show any significant differences between genders (Table 1). The distribution of ratings was also indicated.

#### *Mental Aptitude*

Mental aptitude measures the element of mental acuity in learning, judgement, problem-solving and reasoning ability (Becker, 2006). The male students showed a higher mental aptitude with a mean of 1.82 as compared to the female students who recorded a mean of 1.98. More than 80% of the students had excellent and good ratings in the level of mental aptitude by both genders suggested that students had performed well in analytical thinking and intellectual capability during the industrial training.

Table 1 *The Assessment of Students' Performance by the Employers based on Genders*

D*	Gender**		Rating***				Mean	Std. Deviation	T-test at $\alpha = .05$	p value
			1	2	3	4				
MA	M	No	35	41	14	2	1.82 (Good)	.769	-1.188	.237
		%	38	45	15	2				
	F	No	13	25	8	2	1.98 (Good)	.785		
		%	27	52	17	2				
	Total	No	48	66	22	4	1.87 (Good)	.776		
		%	34	47	16	3				
JC	M	No	27	41	20	4	2.01 (Good)	.832	-.066	.947
		%	29	44	22	5				
	F	No	13	25	6	4	2.02 (Good)	.863		
		%	27	52	13	8				
	Total	No	40	66	26	8	2.01 (Good)	.840		
		%	29	47	19	5				
IS	M	No	40	32	15	5	1.84 (Good)	.893	-.383	.703
		%	43	35	16	6				
	F	No	16	23	7	2	1.90 (Good)	.805		
		%	33	48	15	4				
	Total	No	56	55	22	7	1.86 (Good)	.861		
		%	40	39	16	5				

RS	M	No	31	42	13	6	1.93 (Good)	.862	-.161	.873
		%	34	46	14	6				
	F	No	13	25	9	1	1.96 (Good)	.743		
		%	27	52	19	2				
	Total	No	44	67	22	7	1.94 (Good)	.820		
		%	31	48	16	5				

D\* – Determinant: MA – Mental Aptitude; JC – Job Competency; IS – Interpersonal Skill; RS – Responsibility  
Gender\*\*: M – Male; F – Female; % - Percentage within Gender  
Rating\*\*\*: 1 – Excellent; 2 – Good; 3 – Satisfactory; 4 – Moderate; 5 – Poor

### *Job Competency*

McNamara (2007) described a job as a collection of tasks and responsibilities that an employee is responsible to conduct and competencies refer to general descriptions of the abilities needed to perform such roles in the organization. The male students showed better job competency rating of a mean of 2.01 as compared to the female students who showed a mean of 2.02. According to Kravetz (1999), competencies are built up over time and are not innate, but it typically takes experience on the job to build competencies. In this context, the male students developed job competencies at a faster rate within a period of 8 weeks in each industrial training session. Above 76% of the students of the students performed with excellent and good ratings.

### *Interpersonal Skills*

According to McNamara (2007), to be effective in working with others, individuals must contribute to an environment of mutual trust and respect; relationship with others based on reciprocity, which means that individuals will go out of their way to help others when needed. The male students performed better with a mean of 1.84 as compared to the female students who were rated with a mean of 1.94. Interpersonal skill among the students showed a rating of 79% for excellent and good.

### *Responsibility*

Responsibility, according to Avery (2001) is a feeling of ownership and it leads to leadership skill, as it is common knowledge that leaders are supposed to take responsibility. The performance of students therefore would reflect the ability of the students to develop this leadership skill. The male students showed better performance in their responsibility with a mean of 1.93 as compared to the male students with 1.96. The percentage of students being rated as good and excellent was 79%.

The performances by the category of the students were significantly different on three determinants: Mental Aptitude, Job Competencies and Responsibilities and no significant different in Interpersonal Skill based on ANOVA (Table 2). The Year 3 students were assessed at a lower means in all determinants significantly from Year 1 and 2 students. The result was

attributed by the postponement of industrial trainings by students who had to repeat their academic courses.

Table 2 *The Assessment of Performance by the Employers based on Category of Students*

Determinants	Year	Mean	Std. Deviation	ANOVA p value*Significant at 0.05
Mental Aptitude	1	1.82	.576	
	2	1.81	.816	
	3	2.55	.688	
	Total	1.87	.776	.010*
Job Competency	1	2.03	.674	
	2	1.94	.885	
	3	2.64	.674	
	Total	2.01	.840	.031*
Interpersonal Skills	1	1.62	.739	
	2	1.92	.895	
	3	2.09	.831	
	Total	1.86	.861	.144
Responsibility	1	2.06	.814	
	2	1.84	.790	
	3	2.45	.934	
	Total	1.94	.820	.040*

#### Students' Evaluation

Table 3 shows the students' evaluation of the four determinants: Mental Aptitude, Job Competencies, Interpersonal Skill, and Responsibility.

Table 3 *Students' Evaluation of Performance in Industrial Training based on Genders*

D*	Gender**		Rating***				Mean	Std. Deviation	T-test at $\alpha = .05$	p value
			1	2	3	4				
MA	M	No	4	9	5	1	2.24	.757	1.838	.076
		%	22	50	27	1				
	F	No	4	9	2	0	1.80	.588		
		%	27	60	13	0				
	Total	No	8	18	7	1	2.04	.711		
		%	24	55	20	1				
JC	M	No	0	8	9	1	2.42	.485	2.355	.025*
		%	0	44	50	6				
	F	No	0	11	4	0	2.05	.392		

		%	0	73	27	0				
	Total	No	0	19	13	1	2.25	.476		
		%	0	58	39	3				
IS										
	M	No	1	11	5	1	2.19	.579	1.670	.105
		%	6	61	28	5				
	F	No	4	8	3	0	1.85	.604		
		%	27	53	20	0				
	Total	No	5	19	8	1	2.04	.606		
		%	15	58	24	3				
RS										
	M	No	5	7	5	1	2.11	.900	1.052	.301
		%	28	39	28	5				
	F	No	6	6	3	0	1.80	.772		
		%	40	40	20	0				
	Total	No	11	13	8	1	1.97	.847		
		%	33	39	24	4				

D\* – Determinant: MA – Mental Aptitude; JC – Job Competency; IS – Interpersonal Skill; RS – Responsibility

Gender\*\*: M – Male; F – Female; % - Percentage within Gender

Rating\*\*\*: 1 – Excellent; 2 – Good; 3 – Satisfactory; 4 – Moderate; 5 – Poor

Seventy nine percent of students rated themselves as good to excellent in Mental Aptitude, 58 % Job Competencies, 73 % in Interpersonal Skills and 72 % Responsibilities. Generally the male students rated themselves lower in all the determinants as compared to the female students. There were no significant differences among the categories of the students in the students' evaluation for the year 2008.

### Motivation to Continue Learning

According to Harris, et al. (2007), one of the benefits of industrial training is that it motivates students to learn from their experience in industry. This is being reflected by the students. Industrial training provided the students' motivation to continue learning with a rating of good to excellent by 93% of the female students and only 77 % of the male students (Table 4). The female were more motivated with a mean of 1.53 as compared to the male students with 1.89, although t-test analysis did not show any significant differences between the genders with both rated as good.

Table 4 *Motivation to Continue Learning according to Gender in Industrial Training*

Gender*		Rating**				Mean	Std. Deviation	T-test at $\alpha = .05$	p value
		1	2	3	4				
M	No	6	8	4	0	1.89	.758	1.438	.161
	%	33	44	23	0				
F	No	8	6	1	0	1.53	.640	1.438	.161
	%	53	40	7	0				

Total	No	14	14	5	0	1.73	.719		
	%	42	42	16	0				

Gender\*: M – Male; F – Female; % - Percentage within Gender

Rating\*\*: 1 – Excellent; 2 – Good; 3 – Satisfactory; 4 – Moderate; 5 – Poor

### Comparison between Employers' Assessment and Students' Evaluation

The employers' assessment on students' performance was only conducted for the year 2008 with ratings significantly lower than the mean of the 7 years' period (Table 5). Three of the determinants were rated as Satisfactorily in 2008 as compared to all four determinants being rated as Good from 2001 – 2008.

Table 5 *Comparison between Employers' Assessment for 2001-2008 and 2008*

Determinants	2001-2008		2008		One sample t-test ** $\mu_E = \mu_S$	p value
	Mean	Std Dev	Mean	Std Dev		
Mental Aptitude	1.87	.776	2.40	.754	3.144	.005*
Job Competence	2.01	.840	2.75	.851	3.890	.001*
Interpersonal Skill	1.86	.861	2.80	.894	4.700	.000*
Responsibility	1.90	.820	2.60	.883	4.500	.000*

\*\*  $\mu_E$  – mean of Employers' Assessment and  $\mu_S$  – mean of Students' Evaluation

\* Significance at  $\alpha = .05$

Descriptive statistics of the comparative means of the four determinants between the employers' assessment on students' performance and students' evaluation is shown in Table 6. The students' evaluation on the all determinants was rated significantly higher than the employers' assessment.

Table 6 *Comparison between Employers' Assessment and Students' Evaluation*

Determinants	Employers' Assessment		Students' Evaluation		One sample t-test ** $\mu_E = \mu_S$	p value
	Mean	Std Dev	Mean	Std Dev		
Mental Aptitude	2.40	.754	2.04	.711	-2.906	.007*
Job Competence	2.75	.851	2.25	.476	-6.034	.000*
Interpersonal Skill	2.80	.894	2.04	.606	-7.220	.000*
Responsibility	2.60	.883	1.97	.847	-5.326	.000*

\*\*  $\mu_E$  – mean of Employers' Assessment and  $\mu_S$  – mean of Students' Evaluation

\* Significance at  $\alpha = .05$

The associations of the four determinants between Employers' Assessment and Students' Evaluation were inversely related to each other with low linear correlation as shown by the negative Pearson Correlation values (Table 7).

Table 7 *Pearson Correlation of Determinants between Employers' Assessment and Students' Evaluation*

Employers' Assessment	Students' Evaluation	Significance at $\alpha = .05$
Mental Aptitude	-.213	.368
Job Competence	-.044	.853
Interpersonal Skill	-.146	.538
Responsibility	-.040	.866

#### Students' Evaluation of Industrial Training using Critical Incident Technique (CIT)

Flanagan (1954) developed Critical Incident Technique (CIT) in which a critical incident was defined as one which had an important effect on the final outcome. Carlisle (1986) described the CIT as a method for getting a subjective report while minimising interference from stereotypical reactions or received opinions when the user is asked to focus on one or more critical incidents which they experienced personally in the field of activity being analysed. The most common technique is to have the participants themselves identify, write and reflect on the critical incident, usually in some form of reflective journal, as used in Macfarlane (2003).

The number of satisfied statements and dissatisfied statements identified using CIT totaled to 43 making up of 23 satisfied and 31 dissatisfied (Table 8). Three categories of incident types: knowledge transfer, teamwork and welfare were identified based on both satisfied and dissatisfied statements using CIT. Dissatisfied statements outnumbered satisfied statements in all incident types.

Table 8 *Satisfaction for Overall Critical Incidents based on Three Incident Types*

Incident Type	Satisfied			Dissatisfied			Total	
	No	%	Freq*	No	%	Freq*	No	%
Knowledge Transfer	6	50	40	12	39	51	18	41
Teamwork	2	17	4	6	19	12	8	19
Welfare	4	33	5	13	42	47	17	10
Total	12	23	49	31	73	110	43	100

\* Freq – Frequencies

Most of the students satisfied on the Knowledge Transfer were based on their statements that the trainers had taught them a lot and a reciprocal response to the knowledge transfer by the students. There were three frequencies of female students indicating that they were not prejudiced and were encouraged to study harder as they would make good plantation managers. The dissatisfied statements consist mainly of the trainers were not informative and expectations of more modern technologies. In terms of welfare, the highest frequencies of dissatisfied statements were pertaining to low allowance and poor facilities related to accommodations and transport. Students also complained about employers comparing them with previous students who showed better performances and this was reflected in the lower ratings from the employers for 2008.

## Suggestions for improvement

With respect to knowledge transfer mainly focused on ensuring a more structured training programme to be available so that the students know the objectives of industrial training. In terms of welfare, the students proposed that more allowance should be given while on industrial attachment to enable them to overcome their problems on their food expenses and transportation.

## CONCLUSION

An analysis of the employers' assessment of students' performance on an 8-week training in the plantation from 2001 to 2008, as a partial fulfillment for the Diploma of Plantation and Industrial Management from Universiti Teknologi MARA conducted in Sarawak showed more than 80% of the students obtained ratings of good to excellent in three determinants: Mental Aptitude, Interpersonal Skills and Responsibility and 76% in Job Competency. The students have indicated that the industrial training in which they were exposed to learning-by-doing have provided opportunities for them to enhance and apply what they have learned in their academic programme. Based on their evaluation on the four determinants: Mental Aptitude, Job Competencies, Interpersonal Skills and Responsibilities, they have recognized that the benefits of industrial training in that it had encouraged them to develop; allowed feedback to be given so that they could improve; been motivated to learn from their experience in industry; encouraged to reflect on their work and how it related to academic studies as stated by Harris, et al. (2007).

There was no gender difference in the learning process in all aspects pertaining to the four determinants. The seniority of the students had no influence on the performances of the students in the four determinants.

The employers' assessment on students' performance was rated significant lower than the students' evaluation in all determinants. While the students were satisfied that they had the opportunity to develop their employability skills through the industrial training, the Dissatisfied: Satisfied Ratio of 31:23 using CIT indicated that they had expected better technology exposure than what they had learned from theory. They also had expected better facilities in terms of accommodation and basic amenities. However, the students should realized that in the reality, as stated by one student in his journal report, "No such things as most frustrating and/or unfulfilling in industrial training; such difficulties that the students faced are important to improve ourselves as we are learning from the bottom. Our own poor discipline must be overcome." Further studies should be conducted to relate students' academic performance before and after industrial training.

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