

Teaching and Learning Through Industrial Visits

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Abstract: Industrial visits is an activity carried out to enhance student knowledge on a job field and it aims to expose students to the professions in various organizations. By carrying out an industrial visits the students will get clear nourishment on work discipline which in fact is significantly different in the world of work rather than in classroom learning experience. The purpose of this study is to determine and evaluate the degree of suitability of teaching and learning methods through Industrial visits and to evaluate student's soft skills. Feedback from 35 diploma students of Politeknik Tuanku Syed Sirajuddin in mechanical engineering were obtained. The instruments used were questionnaire, observation and interview with the firm to achieve the objectives of the study. The data were analyzed by using Statistical Package for Social Sciences (SPSS) version 18.0. The value of Cronbach's Alpha 0.877 shows that the questionnaire used was reliable to collect the study data. The findings show that the impact of industrial visits in the teaching and learning process has a positive impact with a mean value of 3.13. This study demonstrates that academic form of industrial visits needs to be continued as it provides more open learning experience for students. Student's soft skills can also be improved in line with the Program Learning Outcome (PLO) of polytechnic. Students found this method very useful and they were able to remember a fair bit of information after about semester from the trip date. Some suggestions from the firm in improving the quality of study at polytechnics are also included.

Key words: Teaching and Learning, Industrial Visit

INTRODUCTION

In order to transform higher education in the context of making Malaysia as a hub of excellence in international higher education, a National Higher Education Strategic Plan has been launched in 2007. Among the key thrusts outlined in the plan is to improve the quality of teaching and learning to create creative, innovative, competent and highly-skilled human capital. For this purpose, the transformation of education to Outcome Based Education (OBE) is an effort to improve the quality of teaching and learning in terms of international requirements such as the Malaysian Engineering Education Membership Rating in the Washington Accord [1]. In addition to the Cumulative Grade Points Average (CGPA) per semester, the measurement of student learning outcomes at the end of the course according to the OBE system will help to evaluate and determine the student's abilities.

In response to this issues, Curriculum Development and Evaluation Division of the Department Of Polytechnic Education has develop

many diploma courses in multiple fields. For example diploma in mechanical engineering aims to prepare students with necessary knowledge, skills and abilities in the mechanical engineering industries. In ensuring the curriculum content fulfills the industrial requirement, several key players from related industries have been involved in the curriculum development process. Some of the Programme Learning Outcomes (PLO) of diploma in mechanical engineering are as stated below:

- PLO6 : Communicate effectively with the engineering community and society at large
- PLO8 : Demonstrate an understanding of professional ethics, responsibilities and norms of engineering practicess
- PLO10 : Demonstrate an understanding of the impact of engineering practices, taking into account the needs for sustainable development

Teaching is the selection of methods or strategies to organize information, activities, approaches and media to help students in achieving the objectives. Teaching can be done through the description,

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demonstration, experimentation or combination of all the methods. Interesting and effective teaching is a process which can produce a good student as required by society and country, Mok Soon Sang [2]. Graduates with relevant skills and knowledge with market demand is the main objective of an academic program at high learning institution. According to Hasliza [3], the education institution serves to provide skilled graduates and the necessary knowledge as well as willingness to handle the changes in industries. In addition, people looking at the educational institutions as the centers of knowledge that produces knowledgeable and independent graduates. However criticisms of graduates are often publicized in local newspapers. They were said to have weaknesses in aspects of communication skills, language skills English, creative thinking and social interaction abilities which needed to find a job. Although many of the academicians think that colleges and universities have to equip their students with the necessary skills, however, from the perspective of employers it is otherwise. There is a significant gap between what is happening as claimed by the academicians with the actual performance achieved by graduates [4]. He found that there was a significant difference between academic staff and employers in terms of written and verbal communication skills, ability to analyze problems, and teamwork.

Through Industrial Visits, it can help to build the students character and intrapersonal skills. Mok Soon Sang [2] states that intrapersonal skills are the ability to shape themselves as appropriate models and can use models to operate effectively in their lives. During the visit, students will also be able to see and learn how to physically highlight and adapt to the surroundings, requirements of the training that need to be met and obeyed. Siti Syuhaila et. al. [5] finds that students are very interested and stunned by the experience of an academic visit done that gives them the opportunity to get closer to their future career and relate the theories learned in the classroom. At the same time, students can enhance interpersonal characteristics, analytical skills and critical thinking with the industry's visit. In short, industry visits provide space for students to actively participate in real-time learning process with lecturers and is a valuable experience. Next, employers in the country questioned the quality of graduates of public institutions of higher learning because were not adequately prepared. The students don't possess personal qualities and skills including special skills such

as writing skills, quantitative and general skills such as presentation as well as communication relevant to the job.

Diploma students of 6th semester across all polytechnics in Malaysia will be sent to undergo industrial training at government or private firms according to student's choice. But a very short training period of only 5 months has forced the management to look for other initiatives for example by providing industry visits to expose students to engineering practices as early as possible in selected engineering industries. The main objective of this industry visit is to help students improve the latest knowledge in world technologies. Therefore, this study was conducted to see how far the industrial visit has had a positive impact on the students in achieving PLOs especially in mechanical engineering diploma students.

OBJECTIVE OF THE STUDY

This study was conducted to:

1. Identify the degree of suitability of Industrial visit as a platform in teaching and learning process in polytechnics
2. Evaluate student's soft skills through industrial visits

METHODOLOGY OF THE STUDY

The study was in quantitative form by using a questionnaire in Likert-4-point scale. Feedback from 35 diploma students of Politeknik Tuanku Syed Sirajuddin in mechanical engineering were obtained after they visited Inari Technology Sdn Bhd on 9th August 2017. In order to determine the respondents' perceptions of the questionnaire data, the mean acquisition is categorized based on mean interpretation as in Table 1.

Table 1: Mean Interpretation

Mean	1.00 – 1.33	1.34 – 2.67	2.68 – 4.00
Mean Interpretation	Low	Medium	High

*Adapted from Wiersma [6].

Observation conducted by researcher with a focus on soft skills among students during the visit. Interviews session were also conducted between

researcher and the firm during the visit with a focus on the needs of a student in dealing with work environment soon. Recommendations from the firm have also been considered in improving the quality of polytechnic graduates.

RESULT AND DISCUSSION

Findings from the questionnaires showed that students strongly agreed with industrial visits conducted with the

high mean value of 3.31 as shown in Table 2. The researcher's findings also suggest that an industrial visits should be done and be in different industries before they undergo industrial training in the 6th semester. Industrial training scheduled for the last semester leaves them unknowledge in engineering jobs. In this regard, an industrial visit is a reasonable step before the students undergo industrial training.

Table 2 : Average of Mean Item

No.	PLO	Assessment Aspect	Number of Items	Average of Mean Item	Interpretation of Mean
1	PLO6	Communicate effectively with the engineering community	3	3.31	High
2	PLO8	understanding of professional etchics, responsibilities and norms of engineering practicess	3	3.34	High
3	PLO10	understanding of the impact of engineering practices, taking into account the needs for sustainable development	4	3.31	High
Average of mean item				3.31	High

In addition, students are struck by the experience of the visit as this is an academic visit that gives them an opportunity to get closer to their real careers. This is reflected in the PLO6 mean score of 3.31. The researcher's findings show students were very interested and have and active communication with the firm. During the visit conducted at Inari Technology Sdn. Bhd, students were exposed to demonstrations as well as an explanation of the process flow of chip production. Students were given enough time to ask about any questions regarding the topic. An active question and answer session provided a positive outcome as in the future the students will be needed to have good communication skills with different levels of employees.

Apart from that, it can raise student's ethical and professional values in the engineering industry. This

can be seen with the mean value of PLO8 which records the value of 3.34. Students were exposed to the ethics and rules at Inari Technology Sdn. Bhd. that are very concerned with hygiene in the producing quality products. Firms also emphasize on improvements in attitude and communication skills among students especially communication skills in English. The researcher agrees with this and it can be seen during the question-answer session where many students were using Malay language as a medium of communication. The finding is consistent with Nigam et al. [7] stating that industry trainers were weak in English proficiency. Study of Ramlee et al. [8] also shows that the trainees of skills program are facing communication weaknesses. According to them, soft skills are very important towards increasing the likelihood of students getting job. In addition, in line with the 4.0 industrial revolution, firm suggested a refinement of the syllabus should be

made by looking to current technologies in manufacturing as it progresses and changes. Significantly difference in knowledge and practice while in institution of study and industry will be detrimental to many, for example, the industry should instruct workers to start from the beginning.

CONCLUSION

Since the average of every PLO is approaching 4.0 point, the industrial visits program should continue as it seen to be a useful learning medium and to create an atmosphere of industry acceptance of students and potential industrial workers. It is recommended that the lecturers relate the learning experience that has been passed with the teaching topic or the existing teaching objectives in the learning module to make the visit experience more meaningful. In such way, the students will understand the relevance of visits with the objective of learning topics. The analysis provides the manifestation that students prefer to undergo industrial visits as an additional method of learning. Among the measures proposed to maximize revenue from industrial visits are through live demonstrations during industrial visits rather than on theoretical. They understand the big picture of the company and also learn about the process involved in making product It is seen to help increasing the student's interest in the real career environment. Polytechnic also need to strengthen student's soft skills for their career development. English language proficiency of the students also need to be strengthened. Involvement of students in any presentation in English at the polytechnic level will create the courage and confidence of students to converse in english when they step into the real working environment.

SUGGESTIONS FOR IMPROVEMENT

The results of this study have led the researcher to present some of the recommendations:

- Collaboration between polytechnics and industry in shaping the skills required by the students.

- Fulfill the polytechnic curriculum with courses and exercises leading to the development of soft skills

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