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Procedia - Social and Behavioral Sciences 195 (2015) 925 – 931

Procedia
Social and Behavioral Sciences

World Conference on Technology, Innovation and Entrepreneurship

Perception of Students Towards Lecturers Teaching Engineering Courses With Industry Experience: A Case Study In Malaysia Technical University

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Abstract

Teaching effectively engineering lessons in class requires a good teaching skill but preparing the undergraduates especially the graduating students with employability skills is indeed a challenging task. In the context of Malaysia Technical University Network (MTUN), the graduating engineering students are expected to be good both in academics and the soft skills in particular of being ready to work as engineers. This is in line with the National Graduate Employability Blueprint 2012-2017 published by the Ministry of Higher Education Malaysia. One of the approaches of getting the knowledge of being an engineer is to learn and experience it from the engineers themselves. It is an advantage for students if the lecturer is an engineer himself preferably with a long attachment in the industry. However such experiential learning is feasible if the university lecturers have exposure to industrial experience as engineers and the students have certain level of fundamental knowledge to maximize the learning process. This paper aims to study the perception of the students to the lecturers with such engineering experience towards their learning experience. The study will adopt the quantitative research methodology. A structure survey instrument will be developed to study the students' perception on the lecturers. The targeted respondents are among the engineering students in one of the technical universities in Malaysia. The data obtained are analyzed and commented using Excel spreadsheet on the frequency and relative importance value. The results show the students do benefit from learning with the experienced lecturers in the context of preparing them for employment as engineers. The high perception also supported by the fact that the majority of the students are planning to be engineers themselves upon graduation coupled with some experiences in the industry plus good fundamentals in academics. The findings indeed support the strategy of technical universities which are highly required to hire lecturers with industrial experience.

Peer-review under responsibility of Istanbul Univeristy.

Keywords: experiental learning;graduate employability;engineering experience;students' perceptions;experienced lecturers

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Peer-review under responsibility of Istanbul Univeristy.
doi:10.1016/j.sbspro.2015.06.372

1. Introduction

In any university program in Malaysia, graduate employability (GE) is one of the key performances being measured by the government to indicate the ability of the institution as being the country's supply of quality and talented human resource. The fresh graduates produced by the universities are expected by the industry to be "ready-made" for the job in the context of having the relevant basic knowledge and skills for the job, good attitude, and good interpersonal skills with high integrity plus the willingness to learn (National Graduate Employability Blueprint, 2012). Employing academic staff with industrial experience or exposure is an advantage to the education system in the institute of higher learning (IHL) because these lecturers have the significant insights into the real needs in the industry on top of the knowledge and skills that they earn during their tenure over the years in the companies. The industrial experience is a critical attribute in preparing the graduates for the real world.

The lecturers who possess significant amount of exposure to industry or having been engineers themselves are probably the most suitable to demonstrate what skills and knowledge actually needed by the graduates in order for them to embrace. This is aligned with the teacher reflection approach in transaction model of teaching and learning where a directly observable characteristic is considered as a teaching process (Dees et al, 2007). On top of the lecturer's industrial experience the students must also be receptive to the lecturer's behavior in order to maximize the learning experience. The industrial experience of the lecturers is to be appreciated and perceived as part of the students learning experience as described in experiential learning model therefore there is a certain level of student's readiness level as the input to maximize the learning process being conducted in the classroom.

This study is conducted to find out the students' perception on lecturers with industrial experience in teaching engineering courses. This is to see whether the lecturer's experience add value to the student's learning experience in engineering courses thus preparing them to be engineers themselves in the real world. The study also gather inputs on students' academic level of performance by their Cumulative Grade Point Average (CGPA) values, desired career path and amount of working experiences that they had on campus to gauge the students' perception on their readiness to enter the job market. High perception on industrial experience lecturers is expected from students who perceive themselves as having a positive attitude to employment readiness.

Therefore the questions that this study is attempted to find out are as follows:

1. What are the perceptions of students to the lecturers with industrial experience in preparing them for employment?
2. What are the attributes of students that embrace the experience sharing by the industrial experienced lecturers?

2. Literature Review And Hypotheses

Experiential learning is a philosophy and methodology in which educators purposefully engage with students in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values (Clark, R.W., et al, 2010). This process is different from teaching by lecturing where most university lecturers are capable of doing because it allows student to learn from experience in a student-centered instruction rather than teacher-centered one (Schellhase, 2006). The lecturers who possess significant amount of exposure to industry or having been engineers themselves are probably the most suitable people to demonstrate what skills and knowledge actually needed by the graduates in order for them to function readily as engineers upon graduation. This experience may be converted to knowledge in the classroom if the students are deeply involved with the learning content of which they must have a personal interest, need or want (Penny, K., et al, 2012). Since the focus of experiential learning is placed on the learning process and not the product of learning, a lecturer with industrial experience is expected to be more capable to bring their experience into the class as the knowledge yet to be experienced by the students by engaging them into meaningful activities in the classroom (University of California Davis, 2011). Additionally the student is also a key element in this experiential learning process as he or she must be personally involved in the approach and having sense of ownership to the activities being conducted by the lecturers. In order to be highly engaged the

student can act as the input to the learning process by having a set of attributes e.g. certain level of academic performance to be regarded as 'ready- to- learn' so that the learning takes place and knowledge is gained (Dees, D.M. et al., 2007).

Lecturers with industrial experience will give the opportunity to students to make mistakes that get consulted immediately in class as what coaches do in sports (Schellhase, 2006). Therefore in the context of enhancing the employability skills, this teaching approach is more likely to be delivered by industrial experienced lecturers. The approach in teaching by involving students to observe what the teacher does in the classroom is aligned with the approach in transaction model of teaching and learning (Dees et al., 2007) where a directly observable characteristics is considered as a teaching process (Md. Omar, H. et al., 2013) . Furthermore a lecturer with extensive knowledge and experience in the industry is expected to be capable in making generalization and provide inferences that go beyond the things that can be observed in a classroom (Md. Omar, H. et al., 2013). Only the used-to-be engineers who are also the lecturers in this study can provide such experience in the classroom by the reflection step in their teaching and learning process (Kolb, D.A., 1984)

Lecturers who had intensive industrial experience may be able to bring the experience to the class in his reflection mode in teaching thus able to give insights to the students on what an engineer should be . These insights combined with positive attitude towards employment should increase the confidence for the students to go for interview and ready to work as an engineer.

3. Methodology

3.1. Research Goal

In this survey the aim is to investigate on the perception of students to lecturers with industrial experience in the context of getting them to be ready for employment. High perception on such lecturers is expected from students who are planning to be engineers as their career and performs adequately well in their academics. Students who have such attributes are regarded as 'employment- ready' in this study.

The survey of this study was conducted on 57 students in the Faculty of Manufacturing Engineering in University Malaysia Pahang (UMP) and was distributed randomly. The students were given a survey asking them to rate their perceptions of their learning from lecturers with high experience and their readiness on being employed. Ratings were made through 21 questions using 5-point Likert scale with possible responses ranging from totally agree to totally disagree (see Table 1). In addition students were asked to answer questions about their amount of their working experience *(experience),* the desired career path upon graduation *(career)* and their academic performance *(academic,* see Table 2.)

Table 1. Survey questions provided to the students.

Questions about Students' Perceptions of Learning from industrial experienced lecturers
Lecturers with engineering experiences is open to new ideas from students in discussing solutions to a given problem *(open)*
I think a lecturer with engineering experiences is able to blend his past industry experiences with his academic lecture and add value to me as a student *(add value)*
By participating in the lecture delivered by engineering experienced lecturer I can imagine the real work of an engineer in the real working world *(imagine)*
Lecturers with engineering experiences help me to appreciate the other courses offered in the program *(program importance)*
My engineering experienced lecturer is able to give inferences beyond the knowledge contained in the reference books in providing solutions *(beyond knowledge)*

I learn about ethics and professionalism by observing the the lecturer's attitude and practice in class *(ethics)*
Questions about Students' Perceptions to their employment readiness
I think my academic performance is of prime importance in order to prepare myself to become employed
I believe my interpersonal skills and good personality will walk myself through the job interview successfully regardless of my academic performance
I understand that being competent means doing the job well with the right skills and apply the relevant knowledge And an entry
I think fundamental courses e.g statics and dynamics is more important than the employability skills courses

Table 2. Survey of students' academic level*(academic)*, amount of working experience *(experience)* and desired career (car*eer).*

Question	Possible Response
Amount of working experience that you have in manufacturing sector or companies *(experience)*	[]less than 3 months []3 months or more []none
Academic performance to-date *(academic)*	[]3.0 and less []More than 3.0 less than 3.5 []3.5 and more
Your desired career path upon graduation *(career)*	[]self employed / business venture []government institutions []further study (masters degree etc) []engineer []others

3.2. Analyses and Results

Survey responses were manually scored (totally disagree =1, disagree =2, do not care/do not know=3, agree=4, totally agree=5) and entered into Excel spreadsheet. Responses to the questions were then grouped into thematic categories of *perceived learning from industrial experienced lecturers* and *perceived employment readiness* (see Table 1). Any case with a missing value for any question was not included in the calculation. To show an overview of responses to the first theme i.e *perceived learning from industrial experienced lecturers,* distribution of responses for all the related questions is plotted as shown in Figure 1. The set of data in this theme is presented in cumulative percentage (see Table 3) where the responses of *totally disagree, disagree* and *do not care* are summed up as cumulative percentage and grouped as 'disagree' whereas the responses in *agree* and *totally agree* is grouped as 'agree' cumulatively. It is observed that a large number of students (more than 80%) reported good perception on learning from the industrial experienced lecturers.

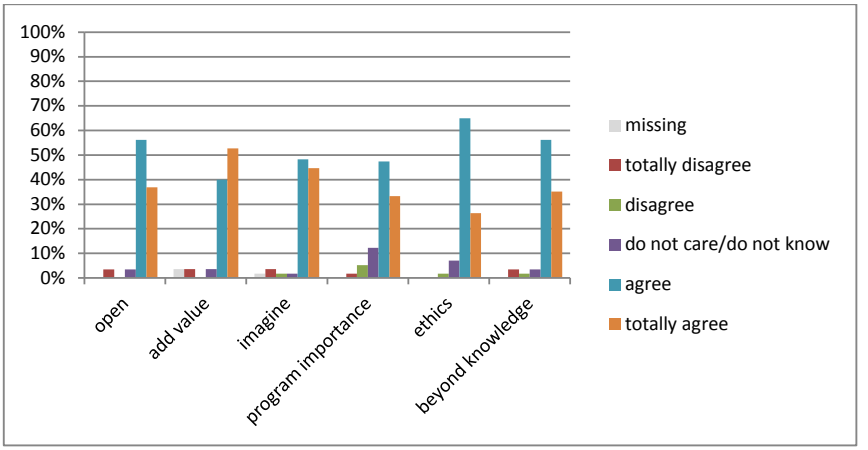

Fig.1. Distribution of responses for questions related to *perceived learning from industrial experienced lecturers*

Table 3.Cumulative of percentage of response in all related questions under theme *Students' Perceptions of Learning from industrial experienced lecturers*

Response	Open	Add value	Imagine	Program importance	Ethics	Beyond knowledge
Disagree	7	7	7	19	9	9
Agree	93	93	93	81	91	91

To express the magnitude of the students' perception in relation to the highest scale of the response i.e totally agree , a relative importance score (Mohd Turan, 2013) is calculated by multiplying the total number of respondents (57) with 5 which is the score given to 'totally agreed' response. The responses from each question in Figure 1 is manually scored (totally disagree =1, disagree =2, do not care/do not know=3, agree=4, totally agree=5) and divided by the highest relative importance score and recorded as a percentage (see Table 4). An average value is then taken from these values to give a mean response (see Table 5)

Table 4.Students' *perceived learning from industrial experienced lecturers as percentage* of response to relative importance score

Response	Open	Add value	Imagine	Program importance	Ethics	Beyond knowledge
Totally disagree	0.7	0.7	0.7	0.4	0	0.7
Disagree	0	0	0.7	2.1	0.7	0.7
Do not care/do not know	2.1	2.2	1.1	7.4	4.2	2.1
Agree	44.9	32.0	38.6	37.9	51.9	44.9
Totally agree	36.8	52.7	44.6	33.3	26.3	35.1

Table 5. Mean value of response in relation to relative importance score

Response	Mean of response in relation to highest relative importance score
Totally disagree	0.53
Disagree	0.70
Do not care/do not know	3.17
Agree	41.70
Totally agree	38.16

Based on the responses, half of the students (50.9%) have working experiences less than 3 months and 63.2% of them have CGPA values of 3.0 and less. In terms of desired career path, 52.6% of the students wish to be engineers upon graduation (see Table 6, Table 8 and Table 9)

Table 6.Students' amount of working experience in manufacturing sector or companies

Duration	Percentage
No experience	17.5
Less than 3 months	50.9
3 months or more	31.6

Table 7.Students' academic performance (CGPA)

CGPA value	Percentage
3.0 and less	63.2
More than 3.0 less than 3.5	33.3
More than 3.5	3.5

Table 8.Students' desired career path upon graduation

Career	Percentage
Engineer	52.6
Pursuing post-graduate study	17.5
Government institutions	7.0
Self-employed	17.5
Others	5.3

4. Conclusion

In conclusion, this study has presented results that students have a good perception on the lecturers with industrial experience. They embrace them with good benefits in the context of bringing them the experience of working in the industry into the classroom. This teaching approach which is best delivered by the lecturers being engineers themselves is what the experiential learning is all about. Lecturers who practice experiential learning techniques are able to guide the learning process and facilitate the lecture to be a student-centered class in which the students learn naturally at their own interest. In the context of employability skills, teaching engineering courses with industrial experience is an advantage to the institution as not only the learning content is delivered in the class but also skills which are indirectly taught in the learning process. This high perception of the students which is demonstrated as more than 80% in cumulative percentage suggests that the students perceive the lecturers as someone who can add value to them i.e. promote high self-esteem , open minded to creative problem solving ideas and demonstrate high professionalism . These are all essentials traits of a role model for them to refer to in preparing them to be good engineers.

Having majority of the respondent (52.6%) chose engineer as their desired career path also justify the needs of the industrial experience lecturers in the engineering program. From the perspective of experiential learning, the students with some experiences in the industry are able to reflect the learning process better with the guidance from the instructor i.e. experienced lecturers (Clark et al., 2010). Of course, good understanding in fundamentals engineering subjects i.e theories which is shown by their academic performance i.e CGPA is important to provide a solid baseline to the learning content delivered in the classroom skills. This study shows that students with good academics and employment readiness combined with the learning process facilitated by the industrial experienced lecturers with experiential learning approach is hoped to be the recipe for producing ready-to-work students as outlined in the National Graduate Employability Blueprint especially in engineering sector.

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