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**Project-Based Learning Evaluation from Students' and Supervisors'  
Perspectives: A Qualitative Research at Polytechnic Malaysia**

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## PROJECT-BASED LEARNING EVALUATION FROM STUDENTS' AND SUPERVISORS' PERSPECTIVES: A QUALITATIVE RESEARCH AT POLYTECHNIC MALAYSIA

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### **Abstract**

*The purpose of this case study was to evaluate the Project-Based Learning that was implemented at the Mechanical Engineering Department in a polytechnic in Malaysia. One kind of constructivism, Project-Based Learning was introduced into the Malaysian polytechnics curriculum regarding to result creative and innovative human resources. This study involved a random sample of 118 students and 43 supervisors in the Mechanical Engineering Department. The study found that both the students and supervisors agreed that Project-Based Learning approach is appropriate for the final project course J5012. In addition, both groups of respondents believed that the supervisors possessed adequate technical knowledge and implemented supervisory duties effectively. Nevertheless, students perceived the module content was hard to understand. The students barely agreed that the machines and equipments at the polytechnic were appropriate for the project. Positively, Polytechnic Kota Bharu should introduce a formal course of Project-Based Learning to the polytechnic system in Malaysia.*

**Keywords:** *Project-Based Learning; Polytechnic; Malaysian Education.*



## **A. Introduction**

Education is an important catalyst in developing talented, relevant, skillful and innovative human resources. Education continues to play a vital role in developing and transforming Malaysia for the next decade. Higher education sector is at the forefront in driving the nation's progress and development. This sector plays a key role in shifting Malaysia's position to become a high income economy by 2020. Technical and Vocational Education (TVE) is one of the various disciplines of education that can generate economic growth of a country (Ramlee & Abu, 2004). TVE was considered to provide opportunities for students who have the tendency toward vocational fields and technology to fulfill the technical workforce. It is perceived as one of the crucial elements in enhancing economics of productivity (Min, 1995; Ramlee & Greenan, 2002). the polytechnics have expanded to become Malaysia's largest public tertiary TVE provider in this country. Project-Based Learning was introduced in the Malaysian polytechnics curriculum in order to produce creative and innovative graduates (Safrina & Saminan, 2015). It is believed that students with Project-Based Learning are energetically involved in authentic inquiry, knowledge construction, autonomous learning, scaffolding, and proposing creative solutions (Chambers et al., 2007).

Principally, Project-Based Learning is about solving real-world problem. Based on Schneider (2005) and Grant (2002), Project-Based Learning is an instructional method that emphasizes student-centered learning by assigning project. Regarding to socio-constructivism view, Project-Based Learning efforts the students on social interaction and group collaboration (Moursund, 2009). In addition, Project-Based Learning is a systematic teaching approach that engages students in learning, real-world problem and life-enhancing skills through creative, scientific, authentic, challenging process and ensuing a product. Project-Based Learning is a dynamic model that focuses on teaching by engaging students in higher order thinking. It is also a tangible model that requires

real-world task, collaborative investigation, and the production of an artifact or a product (Blumenfeld et al., 1991).

However, students perceive that by engaging in a project, they will have some advantages such as, free choice in deciding what they will work on, plan their own project, participate in defining criteria to assess their project, solve problems, and able to present their project (Andreas and Rogers, 2000). Thus, students may have difficulty in Project Based Learning, such as, difficulty to define a research project, to find resources, to manage time, to collaborate with others and to revise the project (Schneider, 2005). The role of the supervisors is to monitor the progress of the project. The supervisor should also facilitate the transfer of learning and to support the students who meet problems while doing the project.

In the traditional paradigm, teachers act as a source of knowledge. However, this kind traditional method, teachers still preferred to teach the exam-oriented system. Thus, it is different from Project-Based Learning, where teachers act as a facilitator of learning. Project-Based Learning is an approach that transforms teaching from “teachers telling” to “students doing” (El Kamoun et al., 2011). In other words, Project-Based Learning offer a different approach with assesing the real world problem, causing a solution and resulting a product. Thus, Project-Based Learning is more encompassing than Problem-Based Learning (Moursund, 2002).

## **B. Method**

This study was a kind of descriptive study intended to observe the students' and supervisors' opinion concerning about the Project-Based Learning at Polytechnic in Malaysia. According to Gall, Borg, and Gall (1996), descriptive research contains providing careful descriptions of a phenomenon. Specifically, this study employed a case study method that concentrated to one polytechnic and to evaluate the effectiveness of “Project-Based Learning” method. The instrument used in this study consisted of a set of interview protocol with four questions. The qualitative data were analyzed by emerging each themes.



There were two populations, the first population was final-project course (J5012) supervisors in the Mechanical Engineering Department in the selected polytechnic. The second population was final-year students who grabbed the final-project course (J5012). The sample consisted of 118 students and 43 supervisors were perceived based on the Krejcie and Morgan Samplesize Table (1970). The interview protocol in this study was based on the research framework in terms to accumulate qualitative data from the students and the supervisors. The questions posed in this study were structured and semi-structured ones. Structured questions were usually posed to clarify some information provided by the respondents. The interview was conducted within 30 minutes and recorded using tape recorder to facilitate the transcription and analysis. For the interview, five students (three females and two male students) and five lecturers were involved for interview. They were selected based on their supervisors' reference. Several drafts of the instrument were reviewed by a panel of experts (one professor in technical and vocational education, one doctor in engineering education and one doctor in Polytechnic Institution).

### **C. Research Finding**

In the process collecting data, interview questioning forms were posed to the students and the supervisors who participated in this research. Transcripts of the interview were analyzed qualitatively to identify the emerging themes. The coding system used in this study was as follows: L is used for student and S for supervisor. In terms of gender, M for male and F for female. In addition, in terms of categories of programs, A was used to represent the Diploma of Mechanical Engineering (Automotive), P was used to represent the Diploma of Mechanical Engineering (Agriculture), and M is used to represent the Diploma of Mechanical Engineering.

Four questions in the interview protocol were formulated to assess the implementation of the Project-Based Learning and to support the quantitative findings. The research themes were separated into four

categories: the knowledge of Project-Based Learning, supervision process, project module, and facilities.

## **1. Knowledge of Project-Based Learning**

The first question was constructed to determine the students' and supervisors' perceptions of Project-Based Learning. From the interview data with the students, there were diverse understandings of Project-Based Learning. One student perceived Project-Based Learning as a theory while another student equated Project-Based Learning with e-SOLMS. In fact, there was one student who said that he never heard about Project-Based Learning. A student (LMP5) stated that he knew about Project-Based Learning as a theory.

*"Yes, I understand. Because [Project-Based Learning] is a kind of theory, then I know what I should do." (LMP5)*

Another student (LFM2) perceived that Project-Based learning as e-SOLMS. E-SOLMS was a kind of media (website) that used along in Project-Based Learning process.

*"[Project-Based Learning] was the using of e-SOLMS website. If we have problems then we use e-SOLMS, our supervisors reply via e-SOLMS every weeks." (LFM2)*

However, there was one student (LFP3) who did not know anything about Project-Based Learning. She was uncertain about Project-Based Learning.

*"I never heard about [Project-Based Learning]." (LFP3)*

The same interview question was asked to the supervisors. Majority of them knew about Project-Based Learning. Similar to the student, a supervisor (SFM5) believed that Project-Based Learning based on theory.

*"Project-Based Learning...[it is] based on theory." (SFM5)*

Another supervisor (SMM1) believed that Project-Based Learning was appropriate to be implemented because it has facilitated the students in the project.



*"[Project-Based Learning] is an applicable method for the students to understand what they should do." (SMM1)*

However, another supervisor (SMM4) thought that Project-Based Learning should be implemented to enable the supervisors to evaluate students' competencies in every semester.

*"Project-Based Learning should be employed to facilitate the supervisors to evaluate project each semester". (SMM4)*

## **2. Supervision Process**

In terms of supervision, the interview data indicated mixed responses regarding the effectiveness of the supervisors. A students seemed their supervisor has supervising and technical skills.

*"That our supervisor has supervising skills." (LMP5)*

Student (LFM1) said that her supervisor possessed both technical and supervising skills.

*"Yes, he has [supervising skill], because he has revealed us how to create the circuit, compute the circuit, and how to install the circuit." (LFM1)*

When the same questions were asked the supervisors, they stated that they possessed the supervising skills. Supervisor (SMM3) said that he has no problem in supervising the students. In addition, he believed that supervisors with education background were better supervisors than those with only technical content.

*"Supervising skill, I have no problem with it because we were education graduate. But nowadays, many lecturers were technical engineering graduates. Thus, they [new lecturers] had poor supervising skills..." (SMM3)*

Another supervisor (SMM4) stated that in terms of supervising skills, he expected his students to come and meet him frequently. He would used e-SOLMS to monitor the students' progress.

*"About that skills [supervising skills]...they [supervisor] were expected their students to come and meet them as often as possible. If the students did not come to discuss, I would monitor my students by using e-SOLMS."*(SMM4)

However, there was one supervisor (SFP2) who claimed that her students' project did not match with her expertise. Thus, the condition has caused difficulty for her to supervise the students in the project.

*"Sometimes the project that I supervised was not appropriate with my knowledge. So that project was out of my knowledge."*(SFP2)

### **3. Project Module**

Concerning about the project management module, there was a varied perceptions of the students about the module. A student (LMM3) believed that the project module was effective.

*"It [the project module] was effective" (LMM3)*

Nevertheless, another student (LFM2) said that some of her project activities did not follow the module.

*"...sometimes my [project] activity based on module, but sometimes it did not." (LFM2)*

In addition, the supervisors were asked about their view of project management module, one supervisor (SMM1) believed that the project module has facilitated the students to focus on what to do in the project.

*"It [project module] means that it helped the students to focus on what to do in the project...[it] help their project progress." (SMM1)*

In addition, there was one supervisor (SFP2) who perceived that they could monitor students' project with e-SOLMS. If she could not see the students, she would use e-SOLMS to discuss with her students.

*"Project was monitored by e-SOLMS. It was good [for supervisor] to monitor the student's work [project] and also if I could not meet my students [face to face], then we'll meet on e-SOLMS [via online]." (SFP2)*



#### 4. Infrastructure and Facilities

Facility, with its adequate and proper tools, and materials are critical in ensuring the students to produce a good invention. Generally, the students perceived main facilities at the polytechnic factory were sufficient. However, some specific materials and tools were not enough. Hence, the students had to buy the material for the project in Kuala Lumpur or Penang as stated by a student (LFM1).

*"In general, facilities in the polytechnic were sufficient, but some instruments were not enough, because of that, we had to buy the instruments outside polytechnic." (LFM1)*

Then, a student (LFM2) thought that the facilities in the polytechnic were enough.

*"...so far, the facilities were sufficient." (LFP2)*

Similar with some supervisors, that said the facility, material, machines were sufficient in the polytechnic. A supervisor (SMM1) claimed that the polytechnic has provided appropriate facility, materials and machines for the project.

*"Main facilities in the polytechnic were adequate for the students, but some specific instruments were not there in the polytechnic, so they [students] have to go to KL or Penang [to buy that instruments]." (SMM1)*

However, another supervisor (SMM3) identified such as main machines for the students' project were adequate but the students did not use them.

*"[The main facilities] were provided, but the students did not use them because the machines were broken or they were not trained to use them." (SMM3)*

Formerly, supervisor (SFM5) agreed that the polytechnic has sufficient material and tools for the students' project. However, because of the limited room-space, some students have to run the project external of polytechnic.

*"Due to limited space [for doing project] some students conducted the project outside the polytechnic." (SFM5)*

#### **D. Discussion**

In terms of the epistemology of Project-Based Learning, almost all of the students perceived that they knew about Project-Based Learning. From the interview data, however, there were mixed perspectives of Project-Based Learning. Some students believed Project-Based Learning as a theory and others perceived Project-Based Learning as e-SOLMS. Those who believed Project-Based Learning as e-SOLMS considered Project-Based Learning as a problem solving using e-SOLMS. Andreas and Rogers (2000) asserted that people when engaging in a project may have different perspectives regarding the project and they might have free choice in deciding what they will work on, plan their own project, select people on their team and solve the problem their own way.

The supervisors, on the other hand, believed Project-Based Learning as a theory. They also assumed that Project-Based Learning is an appropriate approach for the students' final project. However, there were some students and few supervisors who had no clue what Project-Based Learning was all about. Therefore, the Project-Based Learning coordinator should organize briefing session with students and supervisors before the Final Project Course commenced. Regarding e-SOLMS, most supervisors were comfortable with e-SOLMS in monitoring the students' projects. McAlpine, Reidsema and Allen (2006) asserted that online medium may facilitate Project-Based Learning implementation.

In terms of Polytechnic' facilities, some students claimed that some materials for the project were not provided. So, they had to buy some materials themselves. Nevertheless, in general, the respondents stated that the polytechnic has provided the necessary materials, tools and machines needed for the project. Blumenfelt et al. (1991) asserted that a project could take a sizable amount of time and a number of materials to be completed.



## E. Conclusion

Several conclusions could be derived based on the empirical findings of the study. In terms of knowledge, most students believed that they have knowledge about Project-Based Learning but few could not differentiate between Project-Based Learning and e-SOLMS. Meanwhile, the supervisors claimed that they have knowledge on both Project-Based Learning and e-SOLMS. Students stated that the project module has facilitated their activities in the project, although some students still faced difficulty in understanding the content of the project module. Thus, the project module needs to be reevaluated. In terms of supervising skills, some supervisors believed their supervising skills are still poor.

Therefore, a proper training to enhance their supervising skills is deemed necessary. The supervisors claimed that they used e-SOLMS to monitor their students' project activities. The study also found that most supervisors were not formally trained to handle Project-Based Learning. Some have never experienced handling project, planning, management and supervisory tasks. So, it can conclude that the polytechnic staff and students should be formally trained in Problem-Based Learning and e-SOLMS. Hopefully, Polytechnic Kota Bharu should introduce a formal course of Project-Based Learning to the polytechnic system in Malaysia.

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