STUDENT PROJECT MANAGEMENT WITH PROJECT-BASED LEARNING: A PRELIMINARY STUDY IN THE POLYTECHNIC MALAYSIA

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Abstract:
Finishing the project are the main task for last semester students in Polytechnic. They do the project in order finishing the syllabus without any improving skills for their future work in industry. The common educational system has improved the quantity of graduate but not the quality. Many industrial department dissatisfied with the workforce less of soft skills although they have enough hardskills in their field. Technical and vocational education has given an opportunity for students to develop their interested in technical and vocational program. Project Based Learning (PjBL) is one the various learning based on student oriented learning. Project-Based Learning is a student-centered learning approach based on the principles of constructivism to enhance students' learning and creativity by solving a real-world problem. The purpose of this study was to asses the project management system by using Project-Based Learning. This study was held at Mechanical Engineering department at Polytechnic Kota Bharu, Malaysia. We used a set of questionnaire and observation into this research. We found Project-Based Learning are suitable for student project management. PjBL has improve students softskill such as communication skills, work in team, solving problem and creative. Futher application of this study will lead to the development of Project-Based Learning implement in other institution to improve student management project.
Keywords: *PjBL, Student, Project.*

Introduction

Economic competitiveness of a country is based on the skills of its workforce. The skills and competencies of the workforce are dependent on the quality of the country's education and training system. Technical and vocational education is one of the various disciplines of education that can generate economic growth of a country [Ramlee and Abu 1999]. Technical and vocational education has given an opportunity for students to develop their interested in technical and vocational program. Hereby, this will give their propensity to fulfill the workforce in industry. Project Based Learning (PjBL) is one the various learning based on student oriented learning.

Effandi et.al [2006] stated that in the conventional learning, student do not have understanding on the process of learning in the classroom, they tend to keep quiet because they are not convinced and ashamed to ask. Students easily become bored and less motivated to learn because they do not understand the

purpose, meaning and learning application, they also stated that education system in the conventional are still concerned with quantity than quality.

Traditional education has a challenge that deserves special attention. Because of the way technology is continually changing the world, the volume of information and the speed with which new technology concepts arise,has put in doubt the time in which it takes universities to update their curriculum and become adapted to these changes [Timoteo and Brasilerio, 2001, in Santana et al, 2010]. Polytechnic graduate statistic showed us two programs among 10 programs offered at Polytechnic in Malaysia, the higher number of graduate was Hospitality program with 99.4%, and the lowest number of graduate was at Mechanical Engineering programs with 85.4% [Malaysia Higher Education Ministry, 2006]. Since 1969 when the first polytechnics, Ungku Omar was established, the polytechnics system in Malaysia has evolved. With 60.840 students in 2009 to 87,440 in 2012 (Sahul Hamed et al., 2010), the polytechnics have expanded to become Malaysia's largest public tertiary TVE provider in this country. Thus, Project-Based Learning was introduced in the Malaysian polytechnics curriculum in order to produce creative and innovative graduates. It is believed that students which using Project-Based Learning are actively involved in authentic inquiry, knowledge construction, autonomous learning, scaffolding, and proposing creative solutions (Chambers et al., 2007).

Literature Review

Project-Based Learning is a model that organizes learning around projects, based on challenging questions or problems, that involve students in design, problem solving, decision making, or investigate activities, give students the opportunity to work relatively autonomous over extended periods of time, and cultimate in realistic products or presentation [Thomas, 2000]. According to Schneider (2005) and Grant (2002), Project-Based Learning is an instructional approachthat emphasizes student-centered learning by assigning project. In terms of socio-constructivism view, Project-Based Learning drives the students on social interaction and group collaboration. Project-Based Learning is an individual or group activity that goes on over a period of time, resulting in a product, presentation, or performance (Moursund, 2009).

Many students, including women, report that PjBL connects course work to real life experinces, making learning fun and more purposeful by taking abstract concepts and making them more concrete [Zastavker, et al, 2006]. The five criteria of Project Based Learning are (1) PjBL are central, not peripheral to the curriculum, (2) PjBL are focused on questions or problems that "drive" students to encounter the concepts, (3) Projects involve students in a constructive investigation, (4) Projects are student-driven to some significant degree, (5) Projects are realistic not school like [Thomas, 2000].

Historically, the Project Based Learning had started since 16th century. The long evoluation and distinguished history can be divided into five main points :

1. 1590-1765 :first jobs with projects in schools of architecture and engineering in Europe
2. 1766-1880 :establishment of the project method involving education, and later transfer and adaptation in the U.S
3. 1881-1915 :jobs with projects in professional training and in schools in the U.S
4. 1916-1965 :psychologist William Kilpatrick in 1918 published the paper "The Project Method", which globally reinitiates discussion on the subject.
5. 1966-present :rediscovery of teaching method involving projects in its third phase of spreading internationally [Knoll, 1997].

Methodology

This study involved 26 students from Mechanical Engineering Department, Polytechnic Kota Bharu. A survey questionnaire and observation checklist was held as instrumen for this research. A questionnaire with 43 items were built with theory of Thomas [2000] and Killpatrick [1968]. But this paper focused on 5 specific items of project management. They are project time, work, module, skills and products. A five point of Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) was used. The reliability of item was 0.94 (Cronbach's Alpha) which

indicated the instrument is good. Data was analysed by using statictical method by Rasch Model.

Result

Time management is one important thing in project. This item attempt to assess sufficient time for doing project. From the data, about 57 % students agree with the time set for project are enough, whether 27 % they said the time set are not sufficient to the project, because they were imposed to finish the project in four months.

For the item "working project with Project Based Learning concepts", its about 65 % students could do the project with PjBL concepts. This mean PjBL has made their work more easier and structured task. Student structured project was based on module of activity. This module was implement from PjBL concepts. At 71 % students said the module are conceptual and stuctured step for doing project, whether four percents of students strongly disagree with module. The main objective of PjBL are to create students could solve the problem by themselves. While student project are held with PjBL concept, 84 % said their solving problem skill are developed. But 16 % said they have no improvement of this skills. More than 80 % students were

satisfied with the their product. Not more than 8 % students unsatisfied, might be their product not finished yet.

The reliability level of person (respondent) was 0.92, this is meant the respondent's answer level could be trusted. The value of measure person could seen on table 1 as below. The cronbach alpha value was 0.94, where the item reliability value was 0.90 as seen on table 2.

Table 1. Student Satisfaction Level

Items	Percentage
Time for project are enough	57 % agree
Students could work with Project Based Learning concepts	65 % agree
Project management modules are suitable with PjBL	71 % agree
Solving problem skill are improved while doing project	84 % agree
Satisfied with the final project products.	85 % agree

Conclussion

In terms of the epistemology of Project-Based Learning, more than half of the students surveyed claimed that they knew about Project-Based Learning. Project Based Learning has implemented at Mechanical Engineering Department since 2007. In terms of knowledge, most students claimed that they have knowledge about Project-Based Learning but few

Table 2 Measure Person

	Raw Score	Count	Measure	Outfit MNSQ	Outfit Z std
Mean	167.1	43.0	2.26	1.05	.0
S.D.	18.9	.0	.87	.53	2.5
Max.	195.0	43.0	3.80	2.34	4.8
Min.	123.0	43.0	.58	.12	-6.0
REAL RMSE 0.25 ADJ.SD 0.83 SEPARATION 3.37 **Person RELIABILITY 0.92**					
S.E. OF Person MEAN = .17					
person raw score-to-measure correlation = 0.99 cronbach alpha (kr-20) person raw score reliability = 0.94					

Table 3 Measure Item

	Raw Score	Count	Measure	Outfit MNSQ	Outfit Z std
Mean	101.0	26.0	.00	1.05	.0
S.D.	17.1	.0	.98	.55	1.6
Max.	118.0	26.0	3.58	2.90	4.4
Min.	36.0	26.0	-1.45	.38	-2.7
REAL RMSE 0.30 ADJ.SD 0.93 SEPARATION 3.08 **Item RELIABILITY 0 .90**					
S.E. OF Person MEAN = .15					

could not differentiate between Project-Based Learning and e-SOLMS. This clearly suggests that it is necessary to provide exposure about Project-Based Learning to the students and also to their supervisors.

The time allocated for project is four-month in each project session. The students complained that it was insufficient time for the project. Project-Based Learning implemented into online system (e-Students Oriented Learning Management Science), where students and teacher are involved in this system. Not only students, but also teachers/supervisors were not ready to implement this model. Marx, et.al [1997] in Thomas [2000] delineate teacher's enactment problems are time, classroom management, control, support of students, technology use, and assessment.

We plan to continue this pilot study by comparing and analysing data collected with large respondents

(students's and teacher's perceptions of PjBL). We expect that findings from this research will provide informations of the benefits and problems of PjBL implementation in engineering education. Furthermore, the result of this research could help educators to develop new Project-Based Learning approach in education system.

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