

# Roles of New Product Design in Simulation Teaching and Learning Course on Entrepreneurship: A Case Study

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## ABSTRACT

The goal of this study is to see how far the use of new product designs in the innovation in teaching and learning among engineering lecturer from a technical perspective. In this study, the factors being the main study were engineering knowledge for lecturers to produce new product design in the innovation of teaching and learning. This study was carried out on engineering lecturer who teaches courses in entrepreneurship (PB 201) in Sultan Abdul Halim Mu'adzam Shah Polytechnic (POLIMAS). A total of 35 lecturers have been the respondents for the purposes of the implementation of the research, and survey instruments have been used to obtain feedback for the purpose of data collection. The analysis shows that engineering lecturer involved practicing innovation in teaching and learning in POLIMAS. From the findings obtained, it can be concluded that the use of technology innovation in teaching and learning in engineering lecturer POLIMAS of being at a high level. This is where all items are mostly obtained from respondents and to the meaning of the respondents adopt new product design in the innovation in teaching and learning in POLIMAS well. To address the use of technology and innovation in teaching and learning, lecturers need skills result in the changing product technologies as well as further enhance knowledge. A lecturer should be exposed to the latest teaching techniques or learning how to use technology in the classroom, so that the role of teaching and learning more interesting and easily received by students.

**KEYWORDS:** New Product Design, Technology and Innovation, Entrepreneurship, Engineering Lecturer.

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## INTRODUCTION

Innovation is not a new concept in education in Malaysia. Recent literature has offered a more integrated framework, considering both strategic aspects and firm profitability in a balanced scorecard perspective with a cause and effect relationship between leading and lagging indicators. The new product design literatures emphasizes the importance of introducing new products on the market for continuing entrepreneur success. In the last few decades, the number of new product introductions increased dramatically as the industry became more aware of the importance of the new products to business.

The former is just a measure of input, not just considering the productivity and the effort spent in the innovation process. The latter is the "official" result of a process of invention and a partial measure of output, which unable to capture other intangible investments in innovation [3, 4]. There is several kinds of innovation such as product, process and improvements organizational structure. Innovation requires widespread reform to ensure Malaysia provides a commercial neighbourhood of a highly flexible and harmonize.

Education and training agenda of innovation depend on the success of Malaysia who flatter value openness, critical thought and dared to attempt and take risks. This requires an arrangement of pedagogy that fosters the insane capital creative and analytical. The primary focal point of entrepreneurship training and programs in polytechnics is to influence attitudes, knowledge, accomplishments, experiences and competencies of entrepreneurship to the students irrespective of their background [9]. This paper aims to examine how far the use of new product design in the innovation of teaching and learning among engineering lecturer from a technical perspective.

## LITERATURE REVIEW

### Innovation in Education

Education is a process that aims to bring changes to an individual in accordance to the norms and values of a society. In this modern age, educators are responsible for providing education and producing changes in behaviour over a person. They should understand that idea requires proper, adequate and careful strategizing to ensure changes can be implemented successfully.

The measurement of innovation has also generated a lot of debates from different analysis perspectives. The most typical indicators used are research and development (R&D) expenditures and patents [5]. Nevertheless, the former is just a measure of input. It not considering the productivity and the effort spent in the innovation process, and the latter is the “official” result of a process of invention and a partial measure of output which unable to capture other intangible investments in innovation [3, 4].

### **New Product Design**

Innovation is often intended to be as synonymous for R&D, especially in everyday life. However, literature typically refers to the broader meaning of the word which embraces investments in R&D and technology [7, 8], new processes, new products, innovation in terms of marketing and organization and investment in training of human resources. Government, academicians and executives have considered innovation as the main source of economic growth and increasingly competitive advantage.

### **Teaching and Learning**

The tide of change occurring in our country to make the process of educating students is increasingly complex. Thus, the main goal of education for the present day generation is to address the challenges of rapid change in development. At the same time, educators should also help students in order to offset the mental and emotional well-being that can lead to the formation of unhealthy behaviours. This goal can be achieved if educators today are aware of the changes and know that these changes require impartation from various aspects including responsibilities, workload, addition of knowledge and the role that should be played. According to [1], understanding the teacher about innovation in teaching and learning is important for observing the success of its implementation. Failure in carrying out its mission of implementation is sure to raise a bad impression to potential recipients, namely students. Addressing the changes in requirements, educators need to master innovation technologies that are always changing as well as enhance our knowledge.

Educators should practise the culture of reading, learning, thinking and writing. According to [6], through practice and appreciation of the culture of knowledge, educators can be a role model to students. Without the construction of knowledge in innovation in teaching and learning, targeted quite difficult. An increase in knowledge and appropriate technology used by educators to solve problems depends on the ability of the teacher to be a facilitator, problem solver, a catalyst and driver for learning.

### **Problem Statement**

The case study in Sultan Abdul Halim Mu’adzam Shah Polytechnic is about the roles of new product design in simulation teaching and learning course on entrepreneurship module (PB201). Research study on simulation teaching and learning have been studied to obtain data, as previously no research conducted to ensure the validity of relationships.

As well as not in line with the targeted areas of competency knowledge, a lecturer who runs entrepreneurship subjects is the main reason. Entrepreneurship requires greater emphasis on skills and attitudes in comparison to its knowledge. This being an obstacle because the competency level of the lecturers who dominated the practical aspects of entrepreneurship is still limited [2].

Therefore, Department of Polytechnic Education in 2009 mentioned that the Transformation Plan of the Polytechnics is expected to produce graduates who have marketable skills and are enterprising by the year 2015. In [10] point out there is some methods by which entrepreneurship education can be taught effectively in Malaysian polytechnics. The finding confirmed that polytechnic lecturers still not imbued with entrepreneurial tendencies. In this regard, it is in line with [13] who mentions that “Effective entrepreneurs are exceptional learners”. They learned from everything around them. They learn from customers, suppliers and especially competitors. They learn from employees and associates. They learn from other entrepreneurs. They also learn from the experience, from what works and more importantly from what does not work.

## **METHODOLOGY**

The methodology of the study undertaken to identify the technical educator’s knowledge about innovation teaching and learning in Polytechnic. Method or methodology is an important factor to achieve the results that have validity and reliability. Therefore, the method of sampling and analysis is the most important thing before a decision is made. So, the quantitative method were used by the researcher.

A number of things related to steps running study of innovation in the teaching and learning among the technical educators from the perspective of the teacher is like:

- i. Design of study: quantitative methods used to collect the data surveyed by using questionnaires. In [14] stated that the survey method through the use of the questionnaire has been widely used where it is an effective and practical way to obtain information.

- ii. Population and sample study consisted of all engineering lecturer who teaches the subject of entrepreneurship from the four departments of engineering at POLIMAS. A total of 35 lecturers have been identified. Based on [11], for a population of 35 should take at least 32 people as samples. The sample type used is the type of simple random test
- iii. An instrument used in this study is a questionnaire. Researchers was distributed a set of questionnaire to each respondent.
- iv. The review procedures in this instrument, the respondents are asked to indicate an answer to round a number representing each statement produced based on the Likert Scale. According to [12], this scale is used to assess attitudes in various situations and circumstances. The scale of Likert is used to assess both direction of the attitude which is positive and negative, and the strength of the attitude of respondents towards a statement submitted. The score for each item will be submissive to combination, and a percentage value is obtained to determine the degree of frequency of agreement by the respondents.

**RESULTS AND DISCUSSION**

The data processing is a technique for collecting, processing, storing and analysing data. Descriptive statistical analysis was performed on the data collected. Analysis of these data is done manually by calculating the number of respondents, the percentage of and mean. All data collected through the questionnaire will be reviewed in advance so that all instructions are followed correctly.

Table 1: Item analysis of innovation practice by percent (%) and mean

Item	Respondent					Mean
	SNA	NA	NS	A	SA	
<b>I am using computer software in my teaching and learning (T&amp;L)</b>		2.5	7.5	57.5	32.5	4.2
<b>I use technological tools in T&amp;L</b>		2.5	2.5	70.0	25.0	4.2
<b>I use multimedia software in T&amp;L</b>		5.0	5.0	45.0	45.0	4.3
<b>I created induction set my T&amp;L</b>		7.5	5.0	70.0	17.5	4.0
<b>I conduct T&amp;L in English language</b>		20.0	5.0	47.5	22.5	3.6
<b>My T&amp;L is student-centred</b>	5.0	5.0	2.1	62.5	30.0	4.2
<b>I use Problem Based Learning in my T&amp;L</b>		12.0	25.0	47.5	10.0	3.5
<b>I train students to apply thinking skill in learning process to create an idea developing new product design for their studies.</b>	5.0		12.5	45.0	42.5	4.3
<b>I inculcate in students the culture of knowledge</b>			7.5	52.5	40.0	4.3
<b>I strategize my teaching before conducted the lesson</b>				52.5	47.5	4.5
<b>Total mean</b>						4.1

From the findings obtained, it can be concluded that the adaptation of innovations in teaching and learning in engineering lecturer of POLIMAS is at a high level with a mean score of 4.10. This is where all items are mostly obtained from respondents practicing innovation in teaching and learning in POLIMAS well.

For the tenth item namely teaching lecturer strategy in advance before teaching and learning is to have the highest mean score (mean = 4.5). According to [15], education is a process and an activity that aims to bring change into someone. In modern times, the lecturer is responsible to provide an education and produce changes in behaviour over a person. Lecturers should understand the idea changes and carefully strategize to ensure changes are implemented successfully. With the availability of the restructuring strategy prior to teaching and learning undertaken will ensure that every objective accomplished, lecturer adhere with rules, reference materials and lecturers are also able to schedule sufficient time for the duration of the content classes.

The changes in the innovation in teaching and learning, lecturers should utilize the fast evolving technology to enhance our knowledge. Lecturers must adapt a culture of knowledge such as reading, thinking, writing in teaching and learning. This is available for the items to nine, with the second highest mean score (mean = 4.3), lecturer of cultural knowledge in the practice of teaching and learning. According to [6], through practice and appreciation of knowledge, it can be exemplary to their students. Without the application of knowledge in teaching and learning innovation, the targeted goal achieved is quite difficult.

For other items, the respondent has agreed to use technological equipment with software like Autocad, Sketch-up, Microsoft Power Point etc. to supplied to facilitate teaching and learning. The majority of respondents to build an introduction at the beginning of the content set of lessons in order for students to understand the topic that will be taught. In addition, respondents also agreed to adapt a student-centred learning as well as to train students with the skills to utilize students' own independent thinking to find information without the help of lecturers.

Nevertheless, the result of the fifth item is found that respondent carries out teaching and learning in English are at moderate levels (mean = 3.6). The rationale of transition to English medium in entrepreneurship module is the responsibilities of the government's to achieve a developed nation status preparations, where it should be given from the medium stages of education to compete in the era of globalization.

The seventh item has the lowest mean (mean = 3.5) in respondents is problem based learning (PBL) skills in teaching and learning. The respondent may not understand or be equipped to implement PBL, which is not enough to adopt PBL in teaching and learning. PBL is an innovation where the learning process by using this method showed good results by researchers who use it. Design the new product will be given the solution for students to enhance the knowledge and simulate the themselves as a entrepreneurial students.

## CONCLUSION

As a result of the review, the use of creating an idea developing new product design for their studies are still new to being practiced among POLIMAS. They need to be exposed to the culture of innovation and simulation so that students can better understand and experience being an entrepreneur. This method is also seen as be the catalyst to nourish the interest of students into becoming a successful entrepreneur. Simulation methods should be practiced by certain quarters to bear entrepreneurial success in the subject. With the production of new product designs by students, the programme will be made effective.

Lecturer that implement innovation and appropriate practices have also been in teaching and learning as recommended by the curriculum. But, this aspect has to be given priority is training. Adequate training should be given to the lecturer to equip themselves with new methods in teaching and learning, the usage of technology has increasingly become sophisticated with equipment and techniques in depth. This will facilitate the teaching and learning process to run smoothly.

Most of the lecturers have the desire to improve themselves in relation to responsibilities as a professional. These include the teaching and ability to govern and lead their students. Someone should expose to the lecturers in teaching the latest techniques or learn how to use simulation plays an important role in the classroom, so that teaching and learning become more interesting and easily accepted by students. Lecturers would also like to learn all the knowledge related to their field by attending seminars, specialized or related program.

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