



## The Development of edu-Innovation Model on Business Learning Activities for Teacher Trainee: A Fuzzy Delphi Study

Ahmad Sharani Abdul Seliban<sup>1</sup>, Jamasafri Saibon<sup>2</sup> & Siti Zuraidah Md Osman<sup>3</sup>  
<sup>1,2,3</sup> Universiti Sains Malaysia,

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**E-mail address:**

\*corresponding Author:  
sharani685@gmail.com

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### Abstract

*This study is aimed at obtaining expert consent and views on elements of the business course innovation learning activities for teacher trainee. This study uses the Fuzzy Delphi method using Likert 7 scale to collect feedback from 11 experts in various fields of education at public higher education in Malaysia. A total of 2 main elements and 10 sub items of the questionnaire were given to the experts for evaluation. The Fuzzy Delphi method has been used for data analysis. The data were analyzed using triangular fuzzy number and ranking with each model element determined using the 'defuzzification' process. The results of the analysis on consensus and expert consensus show that the value of the agreement is at a good level. This shows that elements of the business course learning activities have been well-received by experts. The elements agreed upon by the experts in consensus are arranged in order of priority namely place, price, product, people, process, physical evidence and promotion.*

**Keyword:** Fuzzy Delphi, Teacher Trainee, Expert, Learning Activities, Innovation

### Introduction

The Teacher Education Institute has become an important part for trained teacher and is a challenge to prepare them with suitable education knowledge and skills of 21<sup>st</sup> century learning. Teacher trainee now days had high interest on technology (Abdul Hadi et. al, 2017) therefore The Teacher Education Institute had to grab this opportunities and prepared them with learning activities combining with the technology usage. The model of the New IPG – Learned Centered University (IPGM, 2011) was first introduced to transform 21<sup>st</sup> century learning such as technology, creative and innovative skills into their curriculum. In principle, this institute are intended to develop a guideline for enhancing learning activities using suitable technology and innovation.

There major issues in IPG from their student perspective is that lecture is good in content and time management but lack on teaching quality (Idrus, Iskandar, & Awang, 2017) and this result shown that the need of proper learning activities to help lecture improving their teaching level especially in business subject. Based on this statement, learning activities has played an important role to enhance teacher trainee skill and knowledge of various subject content. Business subject also needed a proper activity selection because this business field had a board contents (Hagg & Paltonen, 2005). Entrepreneurship, Marketing, Financing, Strategy Management, Operation Management and Economics are the example subject content that include on business subject in teacher education institution while combining with a content such technology (Aliman, Akmaliah, & Pihie, 2015) and innovation (Wilson, 2008) in business subject model are considered to developed. Therefore by using the opportunity of lecture good content on subject, the selection of suitable content of business administration added with improvement in learning activities using a proper technologies are the main focused in this studies. From all of this subject contact, marketing basic principle had been pick according to Mohd Ridhuan et. al. (2015) research of technical education.

In addition to marketing, entrepreneurship also been highlighted in this study to encourage suitable learning activities. Advance countries such as Singapore (Narasimhalu, 2019) and Finland (Mäkimurto-Koivumaa, 2017) including entrepreneurship and innovation skills in their applied business and learning activities. Teaching innovation by providing materials and learning method (Aminuddin, Haziah, & Sharifah, 2019) based on business and entrepreneurship learning concept are used in this study. This concept of learning hopefully will improve teacher trainee teaching style from using 'chalk and talk' (Ibrahim, Adzra'ai, Sueb, & Dalim, 2019) that been also a main issues in primary school and IPG to practical based learning using innovation activities as example. Therefore, using innovation and 7'p of basic marketing principals in teacher trainee learning activities is to obtaining experts and consents view. The main purpose of the study is to examine learning activities element and innovation element for business learning model.

## Literature Review

Few studies on Business course have applied the Fuzzy Delphi method. A study Keikha, & Sargolzaei, (2017) regarded electronic business to consumer from various models identification. The study evaluated business to customers in Iran involving Academic member, E-business manager and Online Marketing Manager. These 14 experts then selected the independent business to consumer model and result presented on two-dimensional map. Another study Jani, et. al, (2018) validating customers' engagement in social networking sites in Malaysia. Using 12 experts from academics and practitioners findings that satisfaction experience with brand also innovation products and service the most agreed upon social networking sites customers. Study also suggested to validating social network sites customer on other theory such as marketing.

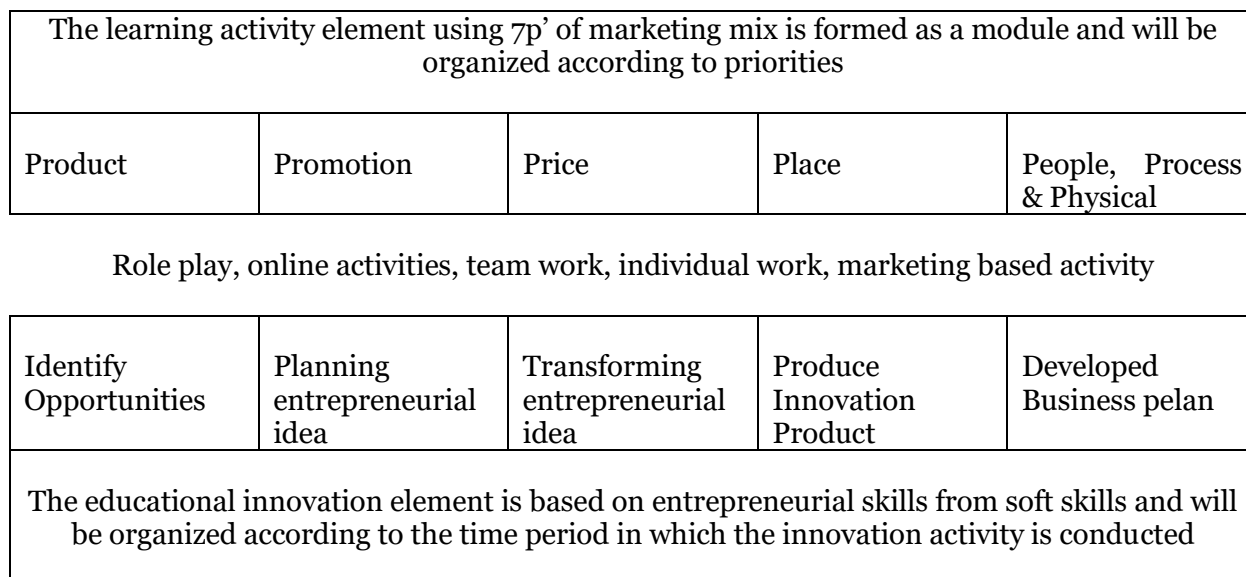
Academic literature likewise reveals the issues and challenges that have been determined in teacher trainee in Malaysia. According to these studies (Ramlan, M.Asri, & A.Jailani, 2019 and Ibrahim, Adzra'ai, Sueb, & Dalim, 2019) the Malaysian government highlighted the improvement of teacher trainee institute. Teacher trainee on practical teaching in Malaysia school have reported

that they lack of guideline needed to work effectively on providing better 21<sup>st</sup> century learning. The lack of learning materials and difficulty of curriculum content (Ibrahim, Adzra'ai, Sueb, & Dalim, 2019) has been discover as a challenges encounter by teacher trainee during practical teaching. Also, 21<sup>st</sup> century teaching profesionalisme development is highly needed by teacher trainee (Ramlan, M.Asri, & A.Jailani, 2019) been identify as a lack that need for improvement. Both previous studies suggest and recommended to focused on learning activities involved critical thinking and innovation.

Furthermore, according to Aminuddin, Haziah & Sharifah (2019) innovation teaching applied by providing materials and learning methods based on relevant lesson concepts. Innovation and creative thinking is one from four management and entrepreneurship domain of soft skills (MQA, 2011). Malaysia Qualification Agency asserting entrepreneurship skills domain such as exploring opportunities, developed risk awareness and ability to seizing opportunities as a standardize for all higher learning institution called as domain soft skill. This domain create innopreneurship skills element of study such as identify opportunities, planning idea, transforming idea, producing innovation product and developed business plan with modification of business education for teacher trainee.

In addition to that, it is necessary for using a proper business lesson concepts included with MQA entrepreneurship skills domain. Another domain is added from Jamil et. Al (2015) study of business lessons concept. This study include basic strategic management, basic financing and basic business findings that basic marketing ranked first by experts. Therefore, the basic marketing principles or marketing mix included 7p' of product, price, place, promotion, people, physical evidence and process are item to purpose in this study.

Meanwhile, there is an increasing number of empirical research in identification marketing mix and implication on business education such as 4p' innovative work (Ali, Ibrahim & Hashim, 2017) and 4p's of entrepreneurial marketing (Ismail et. al., 2018). Furthermore, Ismail et. al. (2018) recommended updating, changing and predict future demand for Product. While Promotion suggested to include digital marketing, Price suggested creative price structuring and Place by utilizing innovative and proactive mindset. The purpose of elements of this study described as figure 1 below.



*Figure 1.* The used of learning activity and Innovation skills elements

Based on figure 1, the 7p' of marketing mix (added with people, process and physical evidence) are the latest research trend in marketing related studies. The empirical research not only just on 7p' of marketing but also correlation it with another approach or model or theory. The correlation of marketing mix and 4I' (Interest, Individuality, Ingenuity, Interactivity) to interactive preschool learning activities (Golubkova, & Rapoport, 2016) and marketing mix and student decision making model (Tijjang, et. al., 2017). However, standardize or adoption approaches applied based on specific culture and value (Larsson, & Jakobsson, 2019). The current research aims to develop a new model or guideline to assess and rank learning activities and innovation skills of teacher trainee using FDM. FDM was utilize to select and determine the final set of criteria used to purpose a learning guideline. This guideline identifies the innovation skills and learning activities to enable future teacher to interact with students within the classroom.

## Methodology

This study used Fuzzy Delphi Method (FDM) in obtaining expert consensus on the elements of the innovation and learning activities. This study consisted of two phases, i.e., the first phase of the research was to analyze the literature in identifying the appropriate elements in the formulation of the study model. After all the factors were obtained referred to table 1.1 and 1.2, the researchers formed a 7-point expert questionnaire and then distributed to 11 experts with extensive expertise and experience with education among indigenous people students.

The questionnaire was comprised with two part: 1) demographics and 2) 10 items of 7-Lickert point scale in 2 tasted construct or elements. The 7-point scale was chosen because the evidence show that higher scale used, the more accurate data obtained (Mohd Jamil, Siraj, Hussain, Noh & Ariffin, 2015). The measurement items are developed based on literature and followed by a round of interviews by academicians to conform verification of captured item. Table 1 are the 7P'

application on learning activities element used based on academic literature and business education course curriculum.

Table 1  
*Element of Learning Activities (LA)*

<b>No.</b>	<b>ELEMENTS:</b>
LA1	Product creating activities
LA2	Promotion in online activities
LA3	Price structuring by recreating Manopoly game activities
LA4	Place goes easy by improving packaging service activities
LA5	People, Process and Physical Evidence consideration on creating business plan activities.

To understand the relationship of education innovation and learning activities for teacher trainee business course, this innopreneurship skills specified as table 2.

Table 2  
*Element of Inno-preneurship skill*

<b>No.</b>	<b>ELEMENTS:</b>
IS1	Identify opportunities through role play
IS2	Planning entrepreneurial idea based on online information search
IS3	Transforming entrepreneurial idea through team work activities
IS4	Producing at least one innovation product in team
IS5	Each person competes in developing his or her own business pelan using a product developed in team

Table 1 and 2 shown a first step of Fuzzy Delphi Method (FDM).

## Results and Discussion

If the average value of threshold ( $d$ ) is less than 0.2, the item has reached a good expert agreement (Cheng and Lin, 2002; Chang, Hsu and Chang, 2011). Whilst this percentage of the overall agreement is 100% of the agreement that is above ( $> 75\%$ ) means meeting the terms of the expert agreement on this item. In addition, all Alpha-Cut defuzzification values (average of fuzzy response) exceed  $a\text{-cut} \Rightarrow 0.5$ . According to Tang and Wu, (2010) alpha cut values should be greater than 0.5 and if less than 0.5, then they should be dropped. The findings of this analysis show elements of innovation based activities have been well received by experts. The experts agreed consensus elements are sorted according to table 3 and 4.

Table 3  
*Learning Activities*

<b>Items</b>	<b>Threshold Value (d)</b>	<b>Percent of Expert Consensus (%)</b>
<b>LA1</b>	0.076	100 (ACCEPTED)
<b>LA2</b>	0.092	91 (ACCEPTED)

<b>LA3</b>	0.071	100 (ACCEPTED)
<b>LA4</b>	0.061	100 (ACCEPTED)
<b>LA5</b>	0.076	100 (ACCEPTED)

Table 4  
*InnoPreneurship Skills*

<b>Items</b>	<b>Threshold Value (d)</b>	<b>Percent of Expert Consensus (%)</b>
<b>IS1</b>	0.100	91 (ACCEPTED)
<b>IS2</b>	0.089	91 (ACCEPTED)
<b>IS3</b>	0.045	100 (ACCEPTED)
<b>IS4</b>	0.061	100 (ACCEPTED)
<b>IS5</b>	0.025	100 (ACCEPTED)

Next, the selected items of Learning Activity (LA) were ranked for priority for implementation in the module sub topic of business education class. The phases were ranked in order: Place (FE = 10.33, AFN = 0.939), Price (FE = 10.23, AFN = 0.930), Promotion (FE = 10.17, AFN = 0.924), People, Process, Physical Evidence and Product (FE = 10.13, AFN = 0.921). Table 5 shows the rankings of the sub-phases of each phase in the guideline. This finding is inconsistent with studies by Larsson, & Jakobsson, (2019) that stated the product was the most important item followed by product. While, price and promotion are least relevant and this result indicates that business requirements especially in marketing are different from business practices, value and culture in different place.

Table 5  
*Findings of the elements of learning activities based on defuzzification process*

<b>ITEM</b>	<b>SCORE VALUE</b>		<b>Rank</b>
	<b>Fuzzy Evaluation</b>	<b>Average of Fuzzy Number</b>	
<b>LA1</b>	10.133	0.921	4
<b>LA2</b>	10.167	0.924	3
<b>LA3</b>	10.233	0.930	2
<b>LA4</b>	10.333	0.939	1
<b>LA5</b>	10.133	0.921	4

While, the selected items of Innovation Skills (IS) were ranked for priority for implementation in the duration for business education class. This was done from Fuzzy Evaluation (FE) and Average of Fuzzy Number (AFN) that score the highest will be in the longest duration time for business class. The phases were ranked in order: Transforming Idea (FE = 10.43, AFN = 0.948), Identify Opportunities (FE = 9.97, AFN = 0.906), Product creation (FE = 9.83, AFN = 0.894), Planning Idea (FE = 9.77, AFN = 0.888) and business pelan development (FE = 9.633, AFN = 0.876). Table 6 shows the rankings of the sub-phases of each phase in the guideline.

Table 6  
Findings of the elements *InnoPreneurship* based on defuzzification process

ITEM	SCORE VALUE		Rank
	Fuzzy Evaluation	Average of Fuzzy Number	
IS1	9.967	0.906	2
IS2	9.767	0.888	4
IS3	10.433	0.948	1
IS4	9.833	0.894	3
IS5	9.633	0.876	5

The edu-Innovation learning activity model for teacher trainee business class developed based on 7ps of marketing mix and 5 entrepreneurship elements of soft skills in the phase.

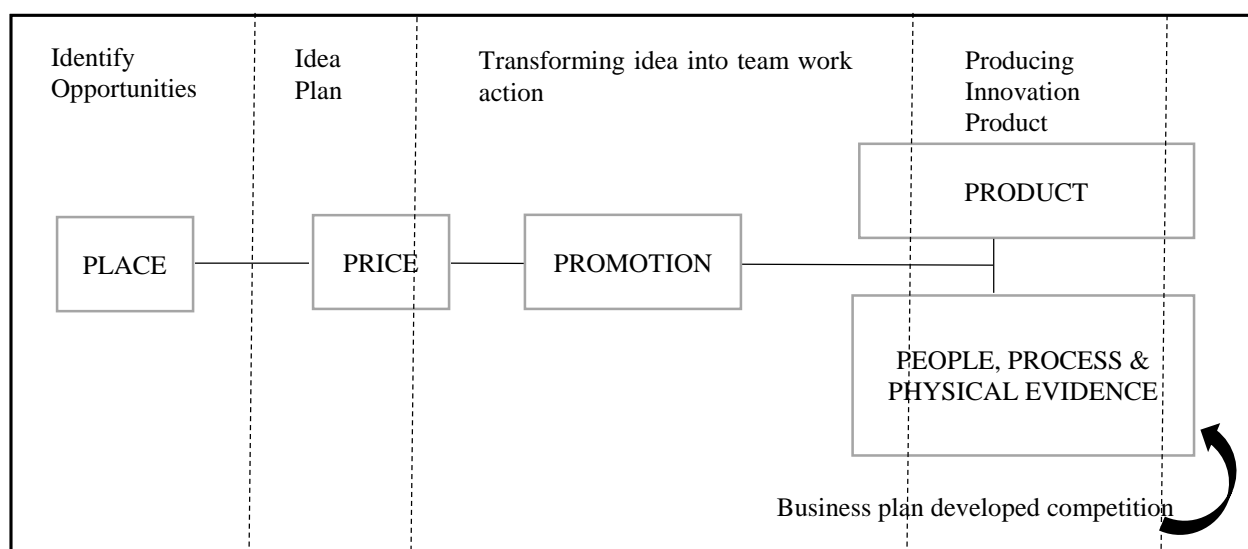


Figure 2. Business Admin Teaching Plan based on FDM Experts Ranked

Figure 2 showed that learning activity with innovation based education been structured according to expert consensus are arranged in order of priority. Learning activity placed in ranked first namely Place goes easy by improving packaging service activities followed by Price structuring by recreating 'Manopoly' game activities and online Promotion activities. Last activity is combination of product innovation created activity and business pelan development consists people, process and physical evidence. For innovation skills started from 8 hour class of identify opportunities, planning idea for 4 hour and transforming idea that ranked 1 involved 10 hour class. For creating innovation product that place 3<sup>rd</sup> in ranked involved 6 hour class and business pelan development competition that ranked last involved just 2 hour class.

## Conclusion

In this study, an instructional model to selected and ranked innovation skills and suitable business learning activities based on consensus among experts. The 7P mix marketing principle was initially used for comprehensive model (Golubkova, & Rapoport, 2016; Tijjang, et. al., 2017; Larsson, & Jakobsson, 2019). Also, the innovation skills are based on entrepreneurship skills from



soft skills (MQA, 2010) been added. Furthermore, the purpose of this study is identification of the important criteria for selecting and evaluating the best entrepreneurship skill and 7p' marketing mix. These 2 elements had five items each are purpose. The five items of learning activities elements including product, price, place, promotion, people, process and physical evidence based on 7p' of marketing mix. While, five items of innovation skills elements including identifying opportunities, planning entrepreneurship idea, transforming idea, creating innovation product and developing business pelan based on entrepreneurship skills of soft skills. Place is ranked as the top for learning activities elements and transforming entrepreneurship idea is ranked as the top for innovation skills elements.

This study has several contributions to the field of Technical and Vocational Education (TVE). Firstly, the main contribution of this paper is the instructional model developed integrated the 7p' of Marketing Mix and entrepreneurship skills for innovation education among teacher trainee, thus filling the gap on this area of knowledge. Secondly, the FDM which was used to achieve consensus among experts could be used for the development of instruction model. The expert agree that reconstruct packaging for placing was important learning activity for teacher trainee. Also the ability to transforming entrepreneur idea to building those idea was important innovation skill for business class in teacher education institution. In addition, all elements been accepted by experts to include in Edu Innovation model. In future, studies should be done on other business content such as customer motivation, strategic management or digital business. Also, studies should be done to explore the effectiveness of the instructional model developed.

The result of this study significant for teacher trainee, teacher education institute lecturer and curriculum designers in business education. The Edu Innovation instructional Model could be used during profesional development programs for both teacher trainee and in service teacher. This Edu Innovation instructional Model also recommended to developed as an instructional module for practitioner usage in classroom or online learning and encourage learning by practice (Wee, Lynda, Megan, 2002; Jesus Sanchez-martin, Cañada-cañada & Dávila-acedo, 2018). Practice learning in business content can help student learn in 21<sup>st</sup> century learning.

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