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The Acceptance of MOOC in Teaching and Learning Process: A Case Study at Malaysian Public University

Nor Hafiza Haron and Yusof Hafidzan

Abstract

The aim of these studies is to investigate the acceptance of MOOC and factors that might influence the use of MOOC at Public Universities. A quantitative technique which is a survey method was conducted at the selected public university where data were collected from 400 respondents. The analysis was then conducted by using Smart PLS software. Meanwhile, the Technology Acceptance Model was implemented as to obtain the findings of this study. The results showed that performance expectancy, effort expectancy, social influence and facilitating condition are factors influencing MOOC usage among students at the particular university. The findings also show that the acceptance level of MOOC learning at this particular university was substantial due to some factors might influence the usage and encouragement of these technologies. The result also shows that there is an area of improvement in term of MOOC learning at these universities in order to make the technologies useful and can be beneficial for long term sight and lifelong learning especially in the context of distance education.

Keywords: MOOC, technology acceptance, smart PLS, lifelong learning, distance education

1. Introduction

Over the past decade, open educational resources or Open Educational Resources (OER) have brought innovation and technology in online-focused education. According to [1], OER is an open source of education by using material for teaching or learning is in the public domain or under a license that allows it to be used, modified or shared with others freely. As a result of this open source education initiative, MOOCs (Massive Open Online Courses) began to grow. Among the OER projects are such as portal sites, databases, MOOCs, Open Courseware (OCW), open textbooks (e-books) and tutorials. In the next chapter the word MOOCs will always be used in this thesis. MOOCs in Malay means courses Open in Massive. Massive or large-scale online Open Courses are an educational innovation in technology and didactic strategy [2].

Along with the development of global technology, education can be expanded by applying elements of lifelong learning that provide access to every individual widely.

According to [3] in open, distance, flexible and online education, including e-Learning providers are also influential in initiating the movement of OERs and MOOCs for both its categories or models. MOOCs are opportunities and playgrounds that perceive such learning as interactions between different people and groups in new ways [4].

The term 'MOOCs' means access or access that is open, global, free and contains video-based instructional materials, has problem sets as well as online forums to a large number of participants who aim to pursue a course or education [5]. Most MOOCs can be accessed by anyone for free online. In addition, this global level of online learning also wants to be applied in education in our country to take advantage of the use of internet access to something more scientific. This approach also offers diverse learning according to the inclinations of each individual [6]. With the changes and evolution in various technologies and methods in online teaching and learning, public universities in Malaysia have kept pace with developments that have taken place specifically in e-Learning programs [7]. To date, almost all public and private universities have applied e-Learning in teaching and learning using various methods and platforms. Furthermore, blended learning method is one of the relatively popular methods in teaching and learning, especially in institutions of higher learning [7].

With blended learning methods, teaching can be done online such as using LMS systems, MOOCs and other appropriate methods. Malaysia was also among the first countries in the world to undertake a global strategy to integrate MOOCs with classes in public institutions later known as blended MOOCs or 'blended MOOCs' [8]. To coordinate the use of MOOCs between public universities, Australia-based OpenLearning has partnered with the IPTA e-Learning Coordinating Council (MEIPTA) to develop a portal of MOOCs in public universities [8]. Therefore, MOOCs are said to be a self-learning platform that is a trend because it is applied in various disciplines, especially at the tertiary level [9]. It is also one of the most ideal learning methods today. This is because of the easy way by simply accessing the learning materials online or online. Furthermore, MOOCs have been used by all groups of students of all ages across the country because of their benefits and having different learning experiences compared to traditional learning [10].

In general, MOOCs can be categorized into two types or models namely cMOOCs and xMOOCs. cMOOCs are a first generation model i.e. it started in 2008. Basically, cMOOCs are an earlier or older type or model, as developed by Siemens [11]. Its main purpose is to create and generate knowledge through interaction among participants or users. In cMOOCs, students take a greater role in shaping their learning experience than in traditional online courses, while facilitators focus on fostering space for learning connection to take place [12]. This is so because cMOOCs are the first models to be developed by previous researchers. According to [13], the term Massive Open Online Courses (MOOCs) describes an evolving ecosystem of open online learning environments, spanning the spectrum of course design ranging from distributed online resource networks (cMOOCs) to platform-centered structured learning pathways digital (xMOOCs). cMOOCs are platforms that focus on the generation of distributed knowledge while xMOOCs are centralized knowledge. Both these types and models of MOOCs have their respective advantages and disadvantages. According to [14], cMOOCs are based on network theory (connectivism) while xMOOCs are based on behaviorist theory. This statement is supported by [15], that the concept of MOOCs is based on two pedagogical foundations in education namely connectivism and behaviorism. In this model of cMOOCs, participants or users are encouraged to use a variety of technologies that can reflect their learning, following the principle of connectivism which considers intense interaction between participants as the basis for knowledge construction [16].

MOOCs are a learning system that adapts the structure of learning content to the desires of individual students because this system is said to model students [17].

In addition, this approach is widely used as an information system and database system to manage, deliver content, interact or facilitate as well as conduct teaching and learning activities [18]. Thus, the purpose of this study is to investigate the factor that might influence the use of MOOC at Public Universities. A quantitative technique which is a survey method was conducted at the selected public university. The response from 400 respondents were analyzed. The analysis was then conducted by using Smart PLS 3.0 version of the software. For now, the Technology Acceptance Model was implemented as to obtain the findings of this study. The result indicated that factor in the UTAUT model act as an important tool to determine the uses of MOOC. The result also shows that there is an area of improvement in term of MOOC learning at these universities in order to make the technologies useful. Furthermore, it can be beneficial for long term sight and encourage lifelong learning especially in the context of distance education and online learning.

2. Technology acceptance

Now days, theory of technology acceptance has been widely used to evaluate the acceptance of technology. It has been widely used to understand and make predictions about consumer acceptance of a new technology [19]. Acceptance of technology is closely related to how a person receives and uses the technology. User acceptance or better known as User Acceptance is an important factor that affects the success of the implementation of a technology [20].

This can show the effectiveness of a technology developed. It is also a general acceptance model for several types of technology such as describing the use of information technology, the use of microcomputers and the use of the internet [21]. Furthermore, technology acceptance theory is also often used in studies related to the application of technology in society [22]. Several theories and models have been designed and are popularly used by most researchers to understand the factors that affect the acceptance and use of technology [23]. Here are some popular technology acceptance theories:

- Theory of Reasoned Action (TRA);
- Motivational Model (MM);
- Theory of Planned Behavior (TPB);
- Decomposed Theory of Planned Behavior (DTPB);
- Technology Acceptance Model (TAM);
- Technology Acceptance Model 2 (TAM2);
- Combined TAM and TPB (C-TAM-TPB);
- Model of PC Utilization (MPCU);
- Social Cognitive Theory (SCT);
- Innovation Diffusion Theory (IDT) and;
- Unified Theory of Acceptance and Use of Technology (UTAUT).

The UTAUT model intentions to study technology acceptance is based on eight theories [24]. Historically, the theory and model such as the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behavior (TPB), the model of Personal Computer Utilization, the Innovation Diffusion Theory and the Social Cognitive Theory were derived from the UTAUT [25]. Past studies show that many studies have applied the UTAUT model in various fields. Unfortunately, very limited research applying the UTAUT model especially in the sector of Education in Malaysia [26]. It is since the use of Information Communication and Technology (ICT) in the Malaysian education system is quite ambiguous [26].

Therefore, the study on the adoption and acceptance use of information technology (IT) is one of the most established streams of information systems (IS) research [27]. In particular, the UTAUT draws on the combination of one or more popular theories such as the Technology Acceptance Model (TAM), the Motivational Model, the model of Personal Computer Utilization, the Innovation Diffusion Theory and the Social Cognitive Theory [28]. The acronym of UTAUT is a Unified Theory of Acceptance and Use of Technology. The UTAUT model as illustrated in **Figure 1** was developed by Venkatesh, Morris, Davis and Davis in 2003 to address the limitations of the Technology Acceptance Model (TAM) and other popular models used in the study of information systems adoption [28]. According to Venkatesh et al. [29] the discrepancy in intention to use described by the contributing models ranged from 17 to 53%. The UTAUT model was found to perform better in terms of variance in intention to use which is related to the technology compared to any of the other eight models. **Figure 1** illustrate the UTAUT Model.

Meanwhile, **Table 1** below refer to the main construct or variables used in this model.

The outcome of the previous studies shown that by using the UTAUT model the effects on behavioral intention were significant to almost for the four construct. The significance of the studies was related to the use of e-learning systems. So in this context, it would also have applied at MOOC. Thus, the study's assumption could be as follows:

- a. Performance has an important influence on students' Behavioral Intention concerning MOOC usage.
- b. Effort has an important influence on students' Behavioral Intention concerning MOOC usage.
- c. Social influence has an important influence on students' Behavioral Intention concerning MOOC usage.
- d. Facilitating condition has an important influence on the MOOC usage.
- e. Behavioral Intentions has an important influence on the MOOC usage.

In this study, Behavioral Intention refers to the pre-determined decision (*antecedent*). It means that the individual action to use the MOOC is determined by their intention. Behavioral intention is theorized to result in Use Behavior, which is MOOC. Furthermore, a few concepts and models have promoted a direct influence of behavioral Intention on Use Behavior; such as Technology Acceptance Model (TAM), Theory Plan Behavior (TPB), UTAUT and UTAUT2.

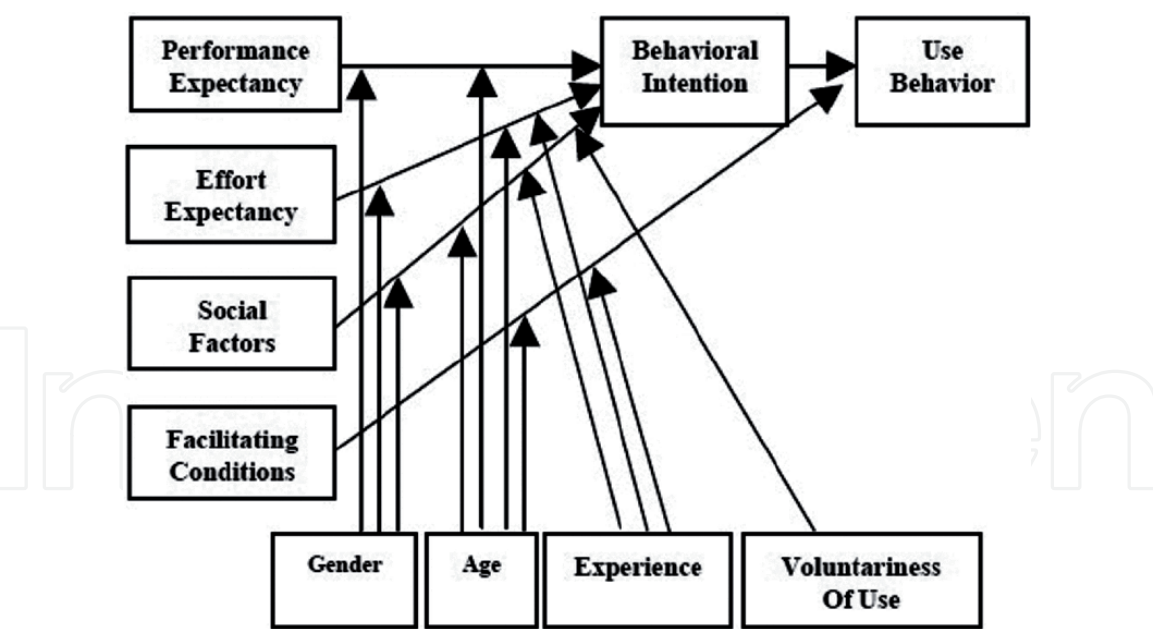


Figure 1.
The unified theory of acceptance and use of technology (UTAUT).

Construct used	Explanation related to the construct
Performance	Performance mean the level of an individual’s belief in the extent to which technology can help to improve her or his job performance.
Effort	Effort is related to the convenience used of certain technology
Social Influence	Social influence is related to the encouragement and support from others to use the particular technology.
Facilitating Condition	Facilitating condition is related to the infrastructural support to use the particular technology.

Table 1.
UTAUT construct.

3. Methodology

This study investigates the technology acceptance of MOOC among students. It implemented at Public Universities. The purpose is to recognize the factors that might affect the use of MOOC among student. Meanwhile, the framework of this research illustrated as in Figure 2.

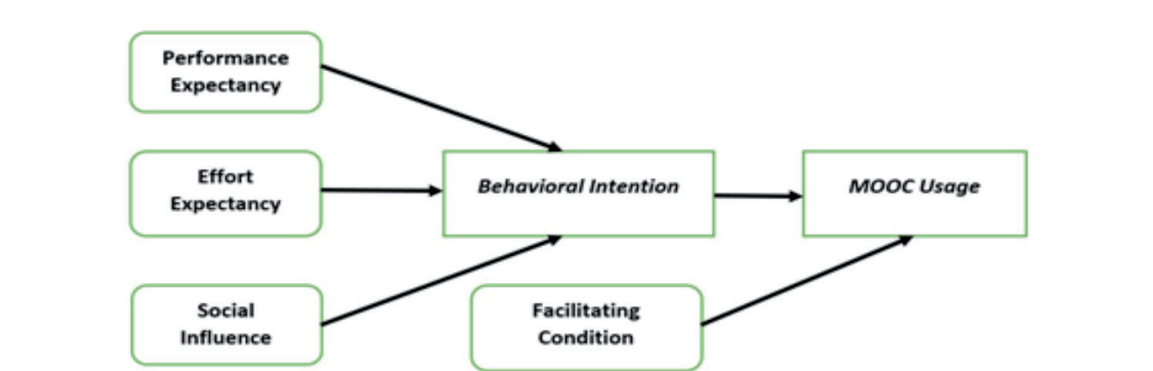


Figure 2.
Research framework.

The quantitative method was used as a methodology in this study. The total sample consists of 400 respondents of the survey. It took students as a sample and the survey being administered at Universiti Kebangsaan Malaysia (UKM). A questionnaire was used in this survey, which consists a part of the item regarding technology acceptance as mentioned before. The Likert-Scale was used in the measurement of the item in the variables and construct used in the questionnaire.

4. Result

In this part, the analysis of the result will be discussed. At the first, the software used for analyze data is Smart PLS version 3. This software has been selected because it's used second-generation statistical technique that enables researchers to examine causal relationships between latent variables [30]. As far as the concern, the results are reflected according to the UTAUT factors that has been discussed earlier. As general, two major methods were used in order to analyze the data which is a measurement and structural model of the statistical technique. **Figure 3** demonstrated the diagram of the construct in the model in the research framework which has been implemented. The implementation of the framework into the path model was done by using the above mentioned software.

The second step was to evaluate the reliability and validity of the construct in the model. These would also include the discriminant validity and convergent validity of the construct. For the meantime, the consistency of the constructs was assessed using Alpha Cronbach.

Table 2 shown that the value of Alpha Cronbach is in the range of 0.7 to 0.9. Thus, the initial step which is the measurement model shows that the value of the construct was good and reflect the study being done.

The next picture displays the factor loading of the item used in the construct is shown in **Figure 4** below. It shows that the factor loading for all construct meet the requirement setting.

Henseler et al. [30] specify that the average variance extracted (AVE) value should be greater than 0.5. It should be reflected for each latent construct in the measurement of convergent validity. So that, **Table 3** shows the AVE values for all constructs were encountered. Then, the technique of Fornell-Larker was applied. This was to assess a discriminant validity of the construct. Again, the value of AVE

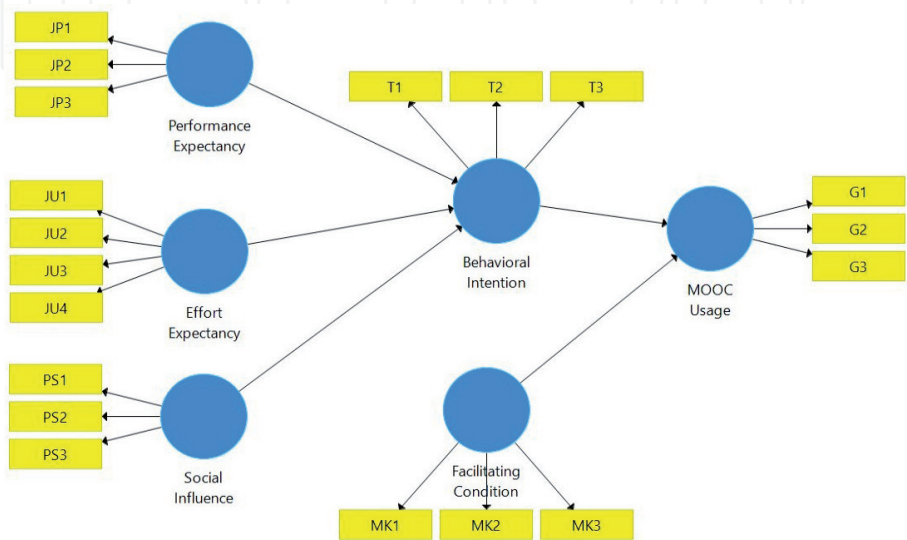


Figure 3.
Measurement model.

Construct	Item	Composite reliability	Cronbach's Alpha
Behavioral Intention	3	0.944	0.910
Effort	4	0.905	0.860
Facilitating Condition	3	0.892	0.818
MOOC Usage	3	0.939	0.902
Performance	3	0.942	0.907
Social Influence	3	0.936	0.897

Table 2.
Construct reliability and consistency.

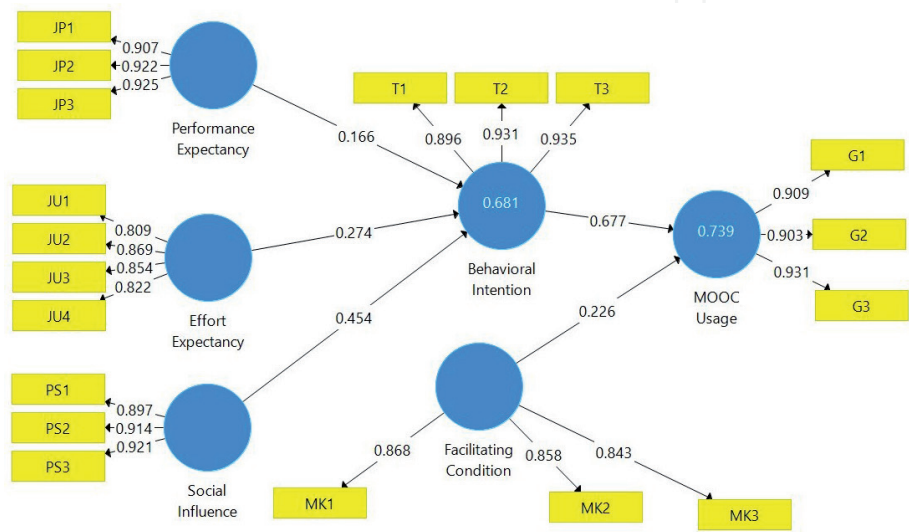


Figure 4.
Factor loading for item in construct.

Construct	AVE	BI	EE	FC	MU	PE	SI
Behavioral Intention_	0.848	0.921					
Effort	0.703	0.748	0.839				
Facilitating Condition	0.733	0.751	0.720	0.856			
MOOC Usage	0.837	0.847	0.743	0.734	0.915		
Performance	0.843	0.719	0.786	0.668	0.706	0.918	
Social Influence	0.830	0.785	0.757	0.696	0.784	0.743	0.911

Table 3.
Discriminant validity using Fornell-larker technique.

should be greater than the highest formed correlations between any other construct [30]. It can also be seen from the table as well. From the result also, the measurement model implemented and assessed shows a good validity of the construct used in the study.

The second step which are structural model then was implemented. In this part, the purpose of structural model was to confirm the significance of path coefficients. The technique of bootstrapping was conducted. These was to determine the significance of each estimated path. The R squared or (R^2) then was considered to estimate the model created. It is to administrate the detailed explanation of the research model. Thus, **Table 4** indicate the detailed results of hypothesis.

Hypothesis path	Path coefficient (B)	T statistics	P values	Results
Behavioral intention → usage behavior	0.677	14.363	0.000	Supported
Effort → behavioral intention	0.274	4.760	0.000	Supported
Facilitating condition → behavioral intention	0.226	4.528	0.000	Supported
Performance → behavioral intention	0.166	2.399	0.008	Supported
Social influence → behavioral intention	0.454	8.202	0.000	Supported
<i>R square (behavioral intention) = 0.681</i>				
<i>R square (mooc usage) = 0.739</i>				

Table 4.
Hypothesis testing.

5. Discussion

The results of the study show that anticipates using the technology of MOOC depends and influenced by certain factors or variables involved in it. It also indicated that factor in the UTAUT model was important to determine the uses of MOOC especially in teaching learning process. For instance, the behavioral intention was essential in order for students use MOOC. The behavioral intention act as antecedent for MOOC usage in term of factors in the UTAUT model such as performance, effort, social influence and facilitating condition.

The social was determined to be an important factor in this study. This is due to student support and encourage each other in order they use MOOC. This would also the concept of online learning which required social interaction in the learning process. Furthermore, a relationship between facilitating conditions and behavioral intention means that the students were also supported by the infrastructure which is exists within their campus. Another important element is that a good internet resource and access to MOOC convenience has made a good reinforcement to a user's apply MOOC. The effort factor is also determined as good influence in the acceptance of MOOC technology as well as performance factor. The finding indicates that students managed to handle and operate the MOOC as well as they believe that the technology can help them perform better in learning.

6. Conclusion

Technology acceptance is a concept of understanding the adoption of technology. As a technology used in this context where MOOC act as a system for e-learning purposes. Many factors that can be contributed in order to influence the user to use MOOC. In this study, the technology acceptance factors remain as per discussed. These factors are very important as they were significant to the MOOC usage. As for the conclusion, the instructor of MOOC especially lecturer who conduct a course online should be exposed more on how to manage the courses online.

To improve the research conducted it will suggest that the further study could be applied at another university in Malaysia. These could clearly understand the MOOC acceptance of online learning as far as the concern of continuance of the technology. Thus, it would have recommended that this method could be used for lifelong learning. Furthermore, this type of technology is very imperative in teaching and learning process due to many countries getting through the Covid-19

pandemic. The concept of teaching and learning online is very crucial especially in the Industrial Revolution 4.0 era and in the context of distance education. The last but not least, an institution or higher learning is the biggest influence in any e-learning project and indirectly gives an impact or effect on the implementation of e-learning. In the context of MOOCs, the institution actually has a role to ensure that elements of infrastructure requirements such as hardware, software, internet facilities on campus are available to encourage the use of MOOCs and cultivate the learning of MOOCs.

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