

MOOC: A Technology Adoption Using UTAUT Model at Public Universities

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Article Info

Volume 83

Page Number: 3146-3151

Publication Issue:

May - June 2020

Abstract

MOOC is a national agenda in the institutions as it is addressed in the 11th Malaysian Plan in the Malaysian Education Blueprint. As it is considering new technology for us, a research towards its acceptance is essential. This study observed the adoption of MOOC deployment among students at selected public universities. A survey method was conducted in this research where data were collected from 350 respondents and then analysed using Smart PLS 3.0 version of software. The findings were collected using the Technology Acceptance Model. The result of the structural path revealed that the variables used in the proposed model supported the hypothesis conducted. It also shows that course design is significant to students use MOOC technology as a learning platform in teaching and learning. Contrary to the UTAUT, the impact of performance expectations on Behavioural Intention was negligible. This study would be helpful for the instructor and instructional designer explain the current situation of technology adoption of MOOC in formulating strategies to encourage the usage of these tools especially in the context of distance education and online learning.

Article History

Article Received: 19 August 2019

Revised: 27 November 2019

Accepted: 29 January 2020

Publication: 12 May 2020

Keywords: MOOC, Technology Adoption, UTAUT, Distance Education, Online Learning.

1. Introduction

MOOC or formerly known as Massive Open Online Course are the course provided to learners in the way of at distance. The appearance of Massive Courses as culture trends in the arena of open distance education lead to the huge scenarios. It is an emerging trend practice in e-learning. As the culture of teaching and learning is often challenging and changing overtime, so these trends is a must. MOOC is a technology of e-learning that is open to any interested participants attended and access courses with materials that are normally free of charge. It could bring thousands of participants register for MOOC courses every day. Although these concepts of learning

are still growing, it is important to inspect the technology adoption of MOOC especially at a higher level of institution. The Government of Malaysia fully promotes the use of MOOC and sees it as a platform for incorporating learning technology as a whole into lifelong learning. At the same time, this led to a new direction in teaching methodologies for undergraduate programs (Saha & Halder 2018). The aim of this research is to observe and understand the technology adoption of MOOC by using a Theory of Acceptance at selected public university. A survey method was conducted in this research where data were collected from 350 respondents and then analysed using Structural Equation Modelling (PLS-SEM). This study would be helpful for the

instructor and instructional designer enlighten the current situation of technology adoption of MOOC in formulating strategies to encourage the usage of these tools especially in the context of distance education and online learning.

2. Literature Review - MOOC

According to Fadzil et al. (2016), Online learning is an important component of the MOOC delivery mechanism to which the stated Blueprint also addresses. MOOCs in Malaysia are likely to see different developments in the next few years, as we can expect greater participation of higher education institutions in response to the recent statements by the Malaysian Government, which have revealed multiple national MOOC targets in the coming years (Gamage et al. 2015). Many believe that MOOC will help revolutionize pedagogy in addition to the obvious benefit of broader access to potentially high-quality teaching and instructional material (Canbek 2015). Nevertheless, an issue such as relates to the way how students learn and whether this tool can assist them in meaningful learning was in debate in fact other global issues. Abeer & Miri (2014) proclaimed that the frees, the more diverse and the more open the MOOC is, the greater the potential for student learning to be constrained by the lack of organization, support and moderation that is usually typically associated with a standard course.

If the Malaysian government and local higher education institutions plan to adopt MOOCs on a large scale, it will definitely have significant implications for the entire national higher education landscape, particularly if they are part of the delivery method in higher education institutions (as presently explored by public universities) as a means of branding and internationalization, or even as part of the advancement of online learning and online distance learning (Fadzil et al. 2016). The popularity of

MOOCs is rapidly growing regardless of its novelty and age. MOOCs quickly attracted attention and attracted academic interest (Abu-Shanab & Musleh 2018). MOOC can usually be divided into two groups. cMOOC and xMOOC are two different MOOC types (Haron et al. 2019). The first MOOC that has concepts developed by George Siemens where it has been built on the basis of Connectivism's learning theory (Fianu et al. 2018). Meanwhile the second category was xMOOCs. xMOOCs which is in the second category are online versions of traditional learning which applying a knowledge diffusion model using such as video recordings of lectures (Kocdar et al. 2017). Its look like the structure of courses at MOOC will fully setup by the lecturer or instructor. Moreover, the xMOOCs comes with a specifies syllabus from the instructor of recorded lectures and also self-assessment. They also employ the original elements of MOOC but it affects the branded IT platforms which offer content distribution partnerships to institutions (Al-Shami et al. 2018).

Technology Acceptance Model – UTAUT

Now days, theory of technology acceptance has been widely used to evaluate the adoption of technology. The famous one is the UTAUT model, which aims to describe acceptance of technologies, depending on eight theories or model acceptance of technology (Khalid et al. 2014). In particular, the UTAUT draws on the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behaviour (TPB), the combined TAM and TPB, the model of Personal Computer Utilization, the Innovation Diffusion Theory and the Social Cognitive Theory (Hamdan et al. 2015). Figure 1 illustrate the UTAUT Model.

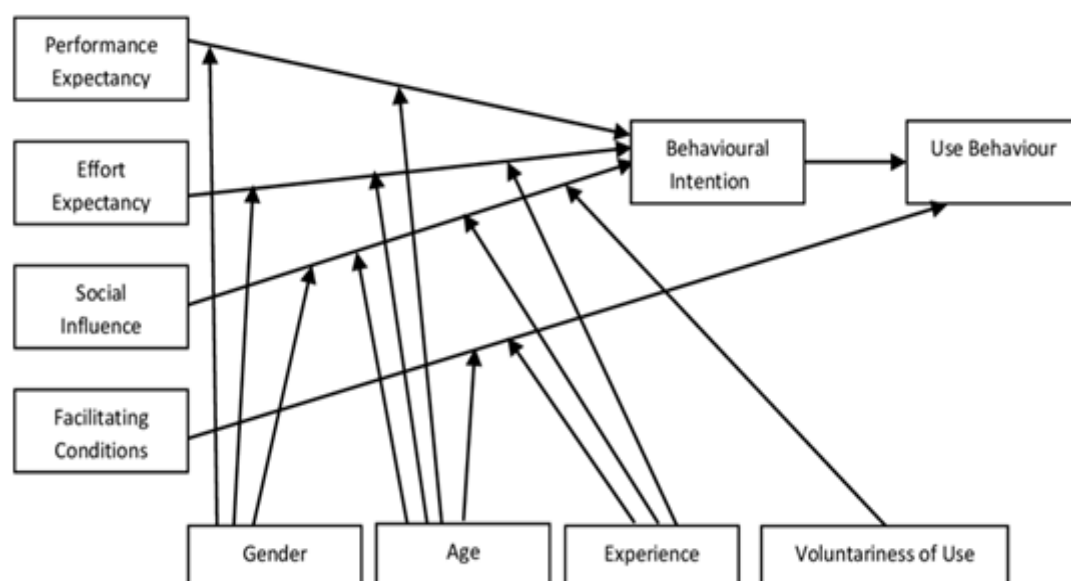


Figure 1: UTAUT Model (Venkatesh et al. 2003)

The variance in the intention to use explained by the contributing models ranged from 17 to 53%, according to Venkatesh et al. (2016). Compared to any of the other eight models, the UTAUT model has been found to perform better in terms of variance in intent to use.

3. Methodology

A survey was conducted in this study where questionnaires has been disseminated to 350 respondents. It took students as a sample and the survey being

administered at Universiti Kebangsaan Malaysia (UKM). Since MOOC has been deployed at this universiti starting 2014, the MOOC learning was implemented together with traditional lecture and combine with the online material. The Unified Theory of Acceptance and Use of Technology (UTAUT) is used in this research where a few variables act as independent variables and dependent variables (Venkatesh et al. 2016). The framework of this study take place as follow:

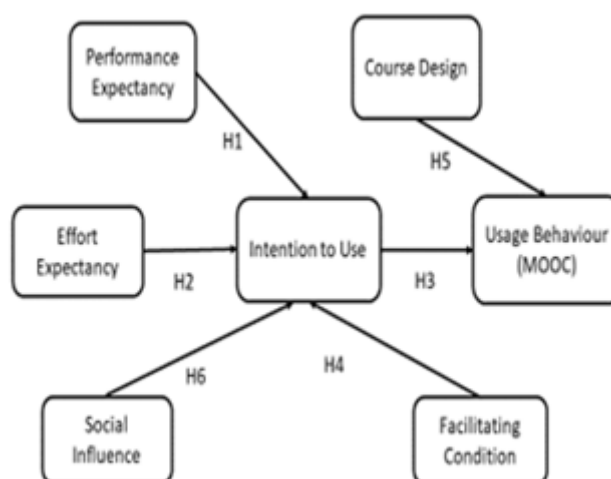


Figure 2: Research Framework and Hypotheses

Table 1 below describe the main construct and variables used in the framework of these research.

Table 1: Variables used in the Framework

Construct/Variable	Description
Performance Expectancy (H1)	Performance expectancy is the degree to which an individual trust that using the system will help him or her in the work performance. (Venkatesh et al. 2003)
Effort Expectancy (H2)	Effort expectancy is the level of convenience associated with the use of the system. (Venkatesh et al. 2003)
Intention to Use (H3)	It is the strength of one's intention to perform a specified behaviour. Fishbein and Ajzen's (1975:288)
Facilitating Condition (H4)	Facilitating condition is the amount to which individuals believe that organizational and technical infrastructure occurs to support the use of the system. (Venkatesh et al. 2003)
Course Design (H5)	It is the process of creating quality learning environments and experiences for students including instructional materials, learning activities, interaction and students' ability to access information from MOOC.
Social Influence (H6)	Social influence is the degree to which an individual sees the significance of others believes he or she should practice the new system. (Venkatesh et al. 2003)

4. Results and Discussion

The first step in analyse the data was to perform composite and reliability test. Another name of this test was convergent validity. By using Smart PLS software to perform structural equation modelling (SEM), a few stages have been led to analysed the construct used in the proposed model. This software used structural equation

modeling because it is a second generation statistical method that allows researchers to analyze causal relationships between latent variables (Fianu et al. 2018). Table 2 illustrated the result of composite and reliability statistics and the value of Cronbach's α . Beside that the structural model evaluation of the research framework was also conducted.

Table 2: Composite and Reliability Statistics

Construct	Number of Item	Composite Realibility	Cronbach's α
Performance Expectancy	3	0.942	0.845
Effort Expectancy	4	0.898	0.897
Social Influence	3	0.936	0.809
Facilitating Condition	3	0.887	0.809
Course Design	3	0.906	0.845
Behavioral Intention	3	0.942	0.907
MOOC Usage	3	0.933	0.893

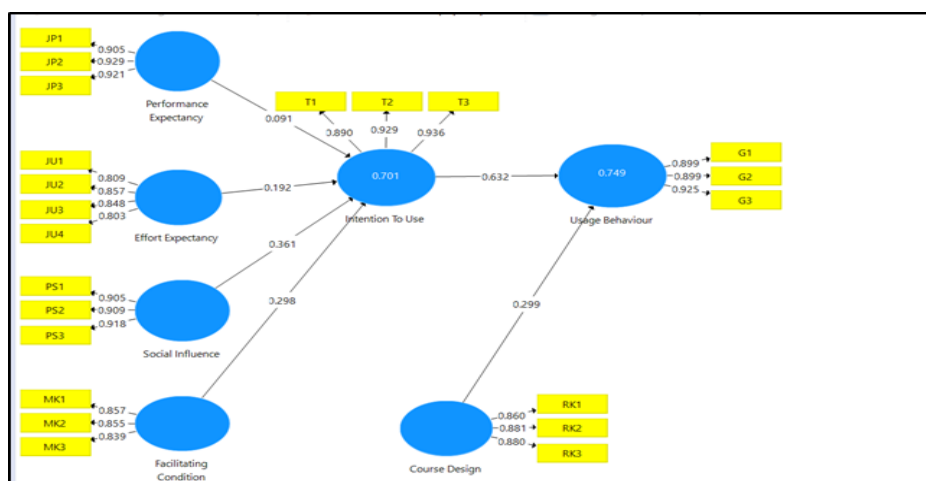


Figure 3: Measurement Model

The discriminant validity test was also assessed after confirming the convergent validity of the construct. By the way, the convergent validity thumb rule stated that the average variance extracted (AVE) for each latent build must be greater than 0.5 value (Henseler et al. (2009). These can be seen from Table 3. Moreover, it can be

determined that the result of measurement model is appropriate. Other than that, the Fornell-Larcker criterion used to measure discriminant validity testing. It states in this method that each latent construct's AVE must be greater than the maximum squared correlations of any other construct. We also conclude on the basis of these, that the result was good.

Table 3: Discriminant Validity Using Fornell-Larcker Criterion

Construct	AVE	CD	EE	FC	BI	PE	SI	MU
Course Design	0.764	0.874						
Effort Expectancy	0.688	0.653	0.830					
Facilitating Condition	0.723	0.742	0.691	0.850				
Intention To Use	0.843	0.689	0.738	0.734	0.918			
Performance Expectancy	0.843	0.600	0.777	0.630	0.685	0.918		
Social Influence	0.829	0.683	0.749	0.683	0.773	0.714	0.910	
Usage Behaviour	0.824	0.735	0.727	0.713	0.838	0.659	0.763	0.908

Finally, the model of structural was assessed. In this technique, *Bootstrapping* was performed to define the significance of each estimated path in the proposed model. The hypothesis testing reveals that Course Design was found to have a significant positive effect on Usage Behaviour (MOOC) where ($\beta = 0.299$, $p = 0.000$). Moreover, Effort Expectancy was found to have a significant effect on Intention to Use where ($\beta = 0.192$, $p = 0.001$). Facilitating Condition also was found to have a significant effect on Intention to Use ($\beta = 0.298$, $p = 0.000$). Contrary to expectations where Performance Expectancy has not been shown to have a major positive impact on Intention to Use ($\beta = 0.091$, $p = 0.086$), which does not provide support for H5.

Meanwhile, it has been found that social influence has a significant positive effect on Intention to Use ($\beta = 0.361$, $p = 0.000$). Intention to use was found, as expected, to have a significant positive effect on usage behaviour ($\beta = 0.632$, $p = 0.000$), providing support for H3. The determination coefficient, R^2 is used to predict the endogenous constructions and to assess the structural model's explanatory strength. Overall, the proposed model accounted for 74.9% of the MOOC Use variance, and 70.1% of the Intention to Use variance (R^2 of 0.701 and 0.749 respectively). Detailed results for the structural model which hypothesis testing is given in Table 4.

Table 4: Hypothesis Testing

Hypothesis Path	Path Coefficient (B)	T Statistics	P Values	Results
Course Design -> Usage Behaviour	0.299	6.807	0.000	Supported
Effort Expectancy -> Intention To Use	0.192	3.065	0.001	Supported
Facilitating Condition -> Intention To Use	0.298	5.809	0.000	Supported
Intention To Use -> Usage Behaviour	0.632	15.020	0.000	Supported
Performance Expectancy -> Intention To Use	0.091	1.368	0.086	Not Supported
Social Influence -> Intention To Use	0.361	6.167	0.000	Supported
<i>R square</i> (Intention to Use) = 0.701				
<i>R square</i> (Usage Behaviour) = 0.749				

5. Conclusion

From the authors point of view regardless of technology acceptance, the results of the study shows that intention to use MOOC is influenced by certain factors or variables attached to it. The study also indicated that usage behaviour of MOOC is influenced by course design and absolutely intention to use. As far as the concern, of course design is not yet explored in the previous study of the technology acceptance. Aspiringly, these could bring the huge impact of MOOC which is the course design was very important as learning in a virtual environment. Furthermore, a good course design conducted by the lecturer or instructor that being used in MOOC would be the factor which was very imperative in the university setting. Lecturer, instructor or even instructional designer could improve the materials, learning activities and enhance interaction in order students to access information associated with the course. Five out of the six hypotheses stated were supported in the research model. These are consistent with UTAUT, where the hypothesis gives the impact towards Intention to Use of MOOC technology. Nonetheless, the study supposed to support all relationships, including extended variables.

Nevertheless, the performance expectancy was found to insignificant to Intention to Use where the value is ($\beta = 0.091$, $p = 0.086$). This could be due to the students at this university strongly do not believe that using MOOC will help them a lot in their learning. Another reason is that

they might have another system such as Learning Management System (LMS) or tools at their campus that being used in the e-learning process. So that they did not rely much in MOOC for attaining gain in their teaching and learning process. This finding also designates that contradict in line with the literature where performance expectancy is usually found to be the most prominent predictor.

However, Social influence was found to be second in importance in this study. It is possibly due to individual believes that he or she must use a MOOC as a new technology. A major relationship between enabling conditions and behavioural purpose indicates that the respondent believed there was infrastructure for promoting their use of MOOC. Resource convenience such as better internet connectivity and suitable devices for MOOC access can be a strong motivation for potential MOOC users and later a deciding factor for MOOC adoption. Effort expectation has also been found to play an important role in MOOC adoption. This finding implies that learners expect a good degree of ease associated with MOOC use. The limitation of the study is that the research conducted at selected public university only. For further research it could apply to all the public universities in Malaysia in order to understand the MOOC adoption and their usage. So that a better improvement and solution can be proposed for the long term benefit of the technology used especially in the Industrial Revolution 4.0 era.

6. Acknowledgments

The authors would like to thank the Kolej Universiti Poly Tech MARA Kuala Lumpur (KUPTM KL) for financial support under micro fund and encouragement to the making of this paper.

References

- [1] Abeer, W. & Miri, B. 2014. Students' Preferences and Views about Learning in a MOOC. *Procedia - Social and Behavioral Sciences* 152: 318–323. doi:10.1016/j.sbspro.2014.09.203
- [2] Abu-Shanab, E. A. & Musleh, S. 2018. The Adoption of Massive Open Online Courses. *International Journal of Web-Based Learning and Teaching Technologies* 13(4): 62–76. doi:10.4018/ijwlts.2018100104
- [3] Al-Shami, S. A., Sedik, S., Rashid, N. & Hussin, H. 2018. An empirical analysis of MOOC adoption from the perspective of institutional theory. *Journal of Advanced Research in Dynamical and Control Systems* 10(6 Special Issue): 332–343.
- [4] Canbek, N. G. 2015. EDUCATIONAL INNOVATION IN E-LEARNING: MOOCs and OER Movements in Turkey. *GLOKALde* 1(January): 19–32. Retrieved from <http://www.glokalde.com/pdf/issues/1/Article2.pdf>
- [5] Fadzil, M., Abdol, L., Tengku, L. & Munira, A. 2016. MOOCs IN MALAYSIA: A PRELIMINARY CASE STUDY. *E-ASEM Forum: Renewing the Lifelong Learning Agenda for the Future*. 1–17.
- [6] Fianu, E., Blewett, C., Ampong, G. & Ofori, K. 2018. Factors Affecting MOOC Usage by Students in Selected Ghanaian Universities. *Education Sciences* 8(2): 70. doi:10.3390/educsci8020070
- [7] Gamage, D., Fernando, S. & Perera, I. 2015. Quality of MOOCs: A review of literature on effectiveness and quality aspects. 2015 8th International Conference on Ubi-Media Computing, *UMEDIA 2015 - Conference Proceedings* 224–229. doi:10.1109/UMEDIA.2015.7297459
- [8] Hamdan, A., Din, R., Manaf, S. Z. A., Salleh, N. S. M. & Kamsin, I. F. 2015. Pengaplikasian UTAUT dalam bidang pendidikan: Satu ulasan sistematik (UTAUT applications in the field of education: A systematic review). *Journal of Advanced Review on Scientific Research* 5(1): 10–29.
- [9] Henseler, J.; Ringle, C.M.; Sinkovics, R.R. The use of partial least squares path modeling in international marketing. In *New Challenges to International Marketin*; Emerald Group Publishing Limited: Bingley, UK, 2009; pp. 277–319.
- [10] Haron, H., Hussin, S., Samad, H., Adnan, R. & Tahir, W. A. N. A. 2019. MASSIVE OPEN ONLINE COURSE (MOOC): ISSUES AND (6): 38–41.
- [11] halid, R., Raman, A., Hussin, F., Ghani, M., Don, Y. & Omar, M. S. 2014. Technology Acceptance on Smart Board among Teachers in Terengganu Using UTAUT Model. *Asian Social Science* 10(11): 71–85. doi:10.5539/ass.v10n11p84
- [12] Kocdar, S., Recep Okur, M. & Bozkurt, A. 2017. An examination of Xmoocs: An embedded single case study based on Conole'S 12 dimensions. *Turkish Online Journal of Distance Education* 18(4): 52–65. doi:10.17718/tojde.340381
- [13] Saha, R. & Halder, U. K. 2018. A Discussion on Massive Open Online Course. *Shinjan IV*(7): 527–539. Retrieved from www.shinjan.in
- [14] Venkatesh, V., Morris, M. G., Davis, G. B. & Davis, F. D. 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly: Management Information Systems* 27(3): 425–478. doi:10.2307/30036540
- [15] Venkatesh, V., Thong, J. Y. L. & Xu, X. 2016. J journal of the A I S association for information systems Unified Theory of Acceptance and Use of Technology: A Synthesis and the Road Ahead. *Journal of the Association for Information Systems* 17(5): 328–376.