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Development of Framework from Adapted TAM with MOOC Platform for Continuity Intention

Ragad M Tawafak[1,2], Sohail Iqbal Malik[1], Ghaliya Alfarsi[1]
[1] *Department of Information Technology, AlBuraimi College, Buraimi, Oman*
2 Faculty of computing, College of Computer Science and Applied Technologies, Universiti Malaysia Pahang, 26300, Pahang, Malaysia
raghad@buc.edu.om, sohail@buc.edu.om, galfarsi@buc.edu.om

Abstract

many studies looking at MOOC continuity of use. The main problem is the weakness of continuous intention to use e-learning application systems. The problem exist is still these studies suffer from mis-continuity of keeping learners to be active and trust of these applications. This study aims to give review of the existing studies and their drawbacks to generate a n adaptive model with minimum mis-continuity. This paper uses original TAM factors in addition to three extra factors available in Task-Technology Fit (TTF) Model. The proposed model developed from the current factor's reliability and existence. The results try to validate the model and test its acceptance using PLS program. Next, the data was coded and translated from paper into PLS program.

Keywords: *TTF, TAM, MOOC features, TEL.*

1. Introduction

Many categories of platforms used for student learning outcomes and they include Massive Open Online Courses (MOOC), MOOC is defined as one of the open source platforms that used for distance learning and have good relationship between instructors and learners (Tawafak, et al., 2019). which are the most world common use of platforms utilized by universities. Likewise, other categories include TEL, manual standardized assessment method and lecturer experience on academic performance in universities with technology use (Becher, 2013, Eldow, et al. 2006). These electronic applications provide information to faculty and administrators on the current state of their students in terms of learning achieved (Tawafak et al, 2018).

Lastly, findings from researchers such as Wu & Tai (2016); Wang & Hannafin (2005); -Tawafak et al. (2018); Malik, et al, (2016), Maas et al. (2014); Lee (2010); Wu & Chen (2017) suggested that the use of technologies such as Wiki chat, multimedia program, blended learning of different technologies like use of Video Blog, T3, and Online exams, Moodle, MOOC, and online learning model of university portals are only applicable to describes the outcomes of individual variables in providing the outcome performance of each approach. However, the authors mentioned that the aforementioned approaches are less applicable in explaining the effect of the variables derived from the models in regards to use and outcome derived from adopting the features in managing electronic learning assessment with continuance intention to use application (Tawafak et al., 2018). Therefore, this study is based on the application of technology-enhanced learning techniques to be tested by adapted (TAM) and combinations of model TAM adaptations as it provides flexibility and freedom to lecturers and students in selecting the proper applications to support teaching and learning through the main target of the continuous intention of use.

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2. Literature Review

In this section, there are 5 studies collected from open database of journals and conferences proceeding related to the acceptance models for using e-learning with MOOC usability and performance to enhance the continuity of system use

As such, recent studies related to MOOC have been published to examine how MOOC extend TAM enhancement model. The both studies, have been published that focused on the learning process involved for course content management to improve teacher-subject knowledge with the interactivity and effectiveness for intention to use technology. These studies are mainly focused on exploring how teacher, student, and technology contribute to improving learning activities in e-learning platforms such as MOOC. Therefore, their targets follow the regression of content, interactivity, and effectiveness to the benefit of faculty and students more than focusing on continuous intention. Table 1 below explain the fourteen studies related to the use of MOOC with TAM and TTF. Some of these studies extended to explain the factors that still used for e-learning model in general. Beside that, Table 1, determine MOOC and common online communication system as the model models used in distance learning.

In relation to e-learning motivation and assessment Mullen et al. (2017) the main weakness or flew is that the approach does not provide more understanding for differences and difficulty of assessment, and it does not measure how student motivation is different when teacher experience act as an active factor to students in a classroom environment.

Ifinedo, Pyke, Anwar (2018), they proposed the application of adapted TAM model suggested that the relations between system use and benefit outcomes through academic performance can be achieved in e-learning. The relationship suggests that when the student participates in an e-learning tool model their academic performance is improved. The relationship further states that as the number of engagement students increases, their learning outcomes improve due to effectiveness of sharing of course materials online. But these studies are still faced with issues that influence the current teaching mechanism and experience on developing teaching method and their impact on continuous intention of use. The finding reveals that all factors used were not in significant relations to improve the continuous intentions, whiles it's an individual effect with combination of control variables. In addition, TAM variables have no influence for any of the proposed factors.

Table 1: Relevent Theories for TAM & MOOC Continuity of Use

Authors/Year	Research Objective	Models Used	Mechanism Applied	Sample Size	Country of study
Ajzen, (1991)	Use belief and behavior concepts for model understanding	TPB	Internet connected, web of 2.0.	215	---
Chen (2010)	Examine factors that relationship e-learning adoption	TTF	Online Learning	220	Taiwan
Theng & Sin (2012)	Introduce support for online learning through building MOOC:	TAM+ E-learning	E-learning	451	---

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Barnard (2013)	Investigate the UTAUT factors relationship on education	UTAUT	Education	---	---
Lin (2013)	Invistigate the relationship between TAM and usability	TAM + E-learning	Online learning	1525	Taiwan
Mathew, et al. (2019)	Investigate the needs of Taiwanese universities to English e-learning websites	TAM	E-learning	---	Taiwan
Stone, Barker-Eveleth (2013)	Enhance e-textbooks through the adoption of continuous intention to use e-books	ECT	Electronic Textbooks	469	United State
Alraimi et al., (2015)	Integrate TAM and ECT in E-learning for discovering factors that effect education	TAM + ECT	E-learning	346	---
Eldow, et al, (2006)	Examine factors that relationship e-learning continuous intention	TAM + ECT	Electronic-books	1434	USA
Parameswaran, Kishore, & Li, (2015)	Use of UTAUT toward engagement of technology continuous intention to use	UTAUT	Web 2.0 technology, Blog tool	250	---
Hone, El said, (2016)	Understand MOOC factors and its retention	---	MOOC	379	Cairo
Islam (2016)	Moderate student learning and teachers teaching skill	---	E-learning	165	Finland
Wu, Chen (2017)	Integrate TAM factors with MOOC features for continuous intention to use	TAM+ TTF+ E-learning	Web 2.0 technology	252	China
Joo, So, Kim (2018)	Examine the relationships among technology acceptance, satisfaction, self-assessment and continuous intention to use	TAM	MOOC	222	---

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Table 2: Derived factors from the previous studies

Author	PU	PEOU	CC	TSK	INT	BI	CI
Tawafak, et al. 2018	y	y	y	y	y	y	y
Hong, Suh, & Kim, (2009)	y	y	x	y		y	Y
Huang, Zhang & Liu, (2017)	Y	Y		x	Y	Y	Y
Hone & El said, (2016)	Y	Y	y		Y	Y	Y
Alraimi et al., (2015)	y	y		y	X	y	y
Joo, So, & Kim (2018)	Y	Y	X	X	Y	Y	Y
Mullen et al. (2017)	y	x		Y	Y	x	Y
Formanek et al., (2017)			x		Y		Y
Lee, Yeung, & Ip (2017)	Y	Y	x	Y	Y	x	Y
Islam, (2016)			Y		Y		Y
Tawafak, et al. (2019)	Y	Y		Y	Y	Y	Y
Hutchinson, & Wells, (2013)	x	x	Y	X		Y	Y
Posey & Pintz, (2016)			Y	Y	y		X
Peltier , et al. (2007)	Y	Y	x	y		x	x

Table 3: Summarized related papers for derived model variables

Authors/ Years	Model Problem	Method Applied Mechanism	Material	Limitation
Schmid, et al, (2014)	How to increase the effectiveness	Use of MOOC and multiple innovative technologies	Survey, open end questionnaire	CI not considered
Posey & Pintz, (2016)	How to evaluate lecturer's teaching method, student performance, and course material evaluation	comprises of (T3) of teaching, transforming, and technology project of Blended Learning	Survey on technology used	CI and EFF not evaluated
Liu (2016)	How TEL used to optimize in universities	use of Web 2.0 application, video BLOG, and face to face interaction	Use of online automatic scoring marks	No relation between outcomes

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Beleche et al (2012)	How online assessment help in outcomes	Use of post-test objective grade and use different faculty for assessment.	Survey for test evaluation	The study ignores CI and TI
Strang (2013)	Missing to the model of instructor collaborative in study approach	Use of TEL and online exams	Survey to improve tool assessment	Only SA , SS, included in this study
Trocky & Buckley (2016)	How to reflect interactivity to improve outcomes	Use of Wikis to improve student learning as collaborative or developed activities, by improving assignments electronically with high satisfaction feedback	Survey, Online open-ended questionnaire	The study not related with CC, TSK and learners.
O'Bannon and Britt (2011)	Effect of using Wiki to create, design and increase the knowledge of lecturers	Use of technology TEL with keep read, write and edit of the material	survey	Only serving Lectures purpose
Naidu And Derani, (2016)	How to investigate the quality standards of each university in relation to the satisfaction students	usage of a survey evaluation (SERVQUAL) universal method tool	survey	Less acceptance than TAM with continuance intention and assessment
Chmiel, et al (2017)	How to improve evaluation framework	TEL with the tools of student, faculty, and administrator	Survey	Not connected with the intention of the portal
Lin & Wu, (2016)	The problem of traditional marking and assessment method	Use of TEL based tools by automatic quiz assessment	Web based survey	The study not related to the interactivity of ease of use in the model assessment
Wilby, et al (2017)	The needs to develop a full assessment system	Create a committee of students, faculty, and administrators to follow the assessment policy and approval checking.	Web based survey	The whole system has the manual procedure without relating to e-learning

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Dargham et al (2013)	The needs to develop a full assessment system	Create direct assessment (online exams) and indirect assessment (projects, teamwork assignments)	Web based survey	The study missed the effect of teacher knowledge and course content with the usefulness

3. The Acceptance Model used for MOOC Features

E-learning has many definitions; one of which is providing teachers with a medium to easily disseminate their knowledge with interactivity that provides effective learning skills freely without being constrained to a specific space and time (Hone & El Said, 2016; MacDonald, et al., 2001; Tawafak, et al. 2018; Ifinedo, Pyke, Anwar, 2018).

3.1 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) by Davis (1989) is the earliest model investigating the acceptance and continuous intention of using technologies. TAM was built from the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) which has four interrelated constructions, namely belief, attitude, intention and behaviour as this model's concern is to justify the behaviour of individuals that relationships the intention of system use. Figure 1, shows TAM factors for actual use of e-learning model.

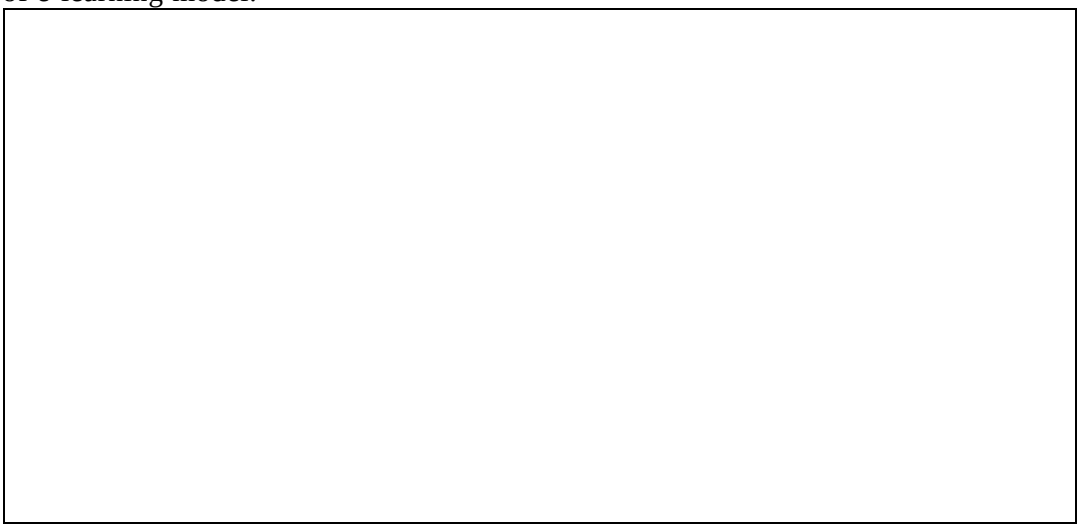

Figure 1: Technology Acceptance Model (TAM), Davis, et al. (1989)

3.2 Task-Technology Fit (TTF)

Task-Technology Fit (TTF) has been adopted and adapted by many studies to test the communication between tools for testing the continuous intention to use e-learning (Larsen, 2009; Junglas, Abraham, & Watson, 2008; Goodhue & Thompson, 1995; Cabada et al., 2018; Furneaux, 2012). The TTF model by Goodhue & Thompson (1995) is illustrated in Figure 2. TTF consists of three factors as 1) Individual characteristics, 2) Task characteristics, and 3) Technology characteristics of which each one also has relationship over TTF. This model reveals the technology use and performance benefits as output from the model.

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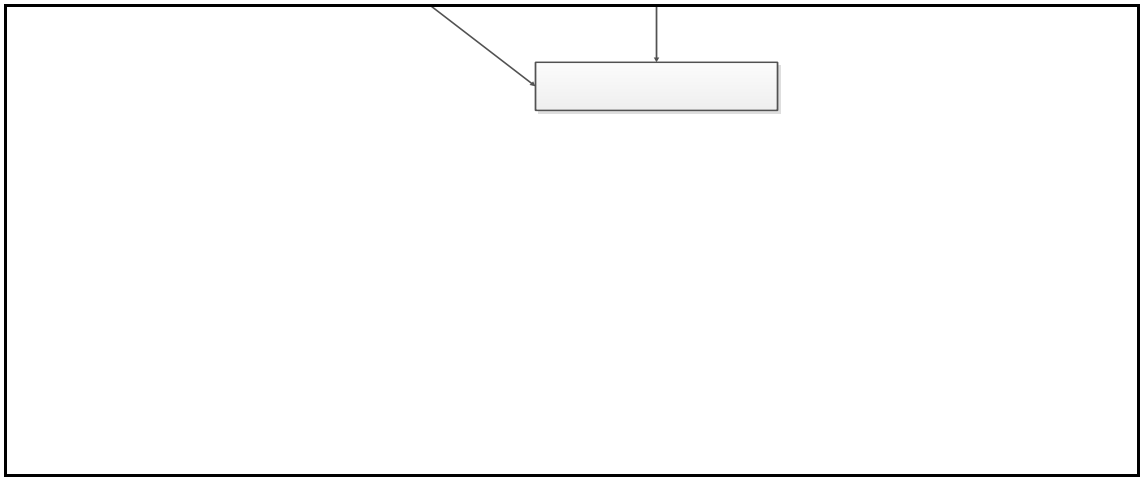

Figure 2: Task Technology Fit (TTF) Goodhue & Thompson (1995)

4 Reliability and Results

In reliability, the Cronbach's alpha value should be > 0.7. while the convergent validity (CV) based on the construct factors that mean each factor loading item should be >0.7. while the average variance extracted should be >0.5. Table 4, shows the PLS results on the model for each item loading factor, the alpha Cronbach's, composite reliability, and the average of variance error.

Table 4: Item loading and reliability

Construct	Item	Loading	Alpha	CR	(AVE)
Interactivity	IN1	0.832			
	IN2	0.876	0.71	0.79	0.64
	IN3	0.890			
Teacher Subject Knowledge	TSK1	0.948	0.84	0.96	0.87
Behaviour Intention	BI1	0.871			
	BI2	0.877	0.81	0.78	0.68
	BI3	0.769			
Perceived ease of use	PEOU3	0.904	0.95	0.94	0.57
	PEOU4	0.785			
Perceived usefulness	PU1	0.992			
	PU2	0.850	0.91	0.92	0.76
	PU3	0.873			
	PU4	0.794			
Content of Course	CC1	0.896			
	CC2	0.751	0.84	0.86	0.91
	CC3	0.864			
	CC4	0.763			
Continuous intention	CI1	0.982			
	CI2	0.812	0.89	0.81	0.83
	CI3	0.741			

5 Predictive Relevance Q2and F2

To evaluate the predictive relevance of the path model, the blindfolding technique was conducted using Smart PLS to generate Q2 and F2 values for all independent variables. Thus, all Q2 values should be above zero suggesting there is a predictive

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relevance as recommended by Hair et al. (2013). Therefore, the current path model is inferred to have predictive relevance for the independent variables as presented in Table 6. Likewise, F2 values of independent variables above 0.018 indicate that there is a small effect, 0.15 indicates medium effects, and 0.815 indicate there is a large effect on the independent variable on the dependent variable (Hair et al., 2013). The results of the F2 and Q2 values for the model are presented in Table 6.

Table 6: Path coefficient, f2 and Q2 results

Relationship	Path coefficient	F^2	Q^2
AP→ CI	0.152	0.190	0.160
BI→ AP	0.360	0.236	0.545
CC→effect	0.293	0.190	0.815
CC→ Std sat	0.261	0.380	0.119
Effect→ CI	0.420	0.323	0.303
INT→ Effect	-0.284	0.102	0.430
PEOU→ BI	0.302	0.200	0.544
PEOU→PU	0.393	0.150	0.582
PU→BI	0.293	0.245	0.636
PU→ Std- Sat	0.326	0.400	0.145
Std-Sat→ CI	0.192	0.170	0.118
Sup-Ass→ CI	0.138	0.200	0.018
TSK→ Effect	0.084	0.360	0.202
TI→ BI	0.050	0.240	0.181
PEOU→ Std-Sat	0.150	0.240	0.372
INT→ Sup-Ass	0.377	0.330	0.152

6 Research Contributions

This research offers a practical and theoretical contribution. Theoretically, this study employed the TAM factors to enhances and further investigate the adoption of TAM model as an online educational model. Furthermore, this research provides a theoretical contribution by extending TAM constructs and associated items to improve the learning process and to enhance the continued intention of students to use the adopted model for technology validation. The model also provides a roadmap on how the following factors (course contents, teacher subject knowledge, technology integration, and interactivity) as independent variables influence the continued intention to use.

Acknowledgments

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Authors

Author's Name, Ragad M Tawafak

Ragad moufaq Tawafak currently works at the Department of Information Technology, Al Buraimi University College. She got her PhD degree from university Malaysia pahang on 2020. She completed her M.S.c. in computer science at Mosul university in 2000. Her bachelor degree was in expert systems from Mosul university at 1998. Ragad does research in Information Science. Their current project is 'BUC Electronic HR System'. and many e-learning publications, quality assurance, acceptance models of TAM.

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Author's Name, Author Name: Sohail's research interest includes Algorithmic Thinking, Computer Education, Technology in Education, Problem Solving Skills and Mobile Learning.

Author's Name, Ghaliya Alfarsi .EXPERIENCE (About 6-8 Lines): Ghaliya AlFarsi got her Master degree in computer science at the University of Sohar in Oman (2015), and Bachelor of Science degree in Computer Science at Ajman University, AlAin, UAE (2004). she is a lecturer in information technology department in ALBuraimi College, Oman more than twelve years. Most of her publications were indexed under Scopus. her research expertise are in knowledge management, integrated system, e-learning, m-learning and image proccesing.And published in international journals.

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