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A Review Studies on Acceptance and Use of MOOCs in HEIs: Applying UTAUT2

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Abstract

Massive Open Online Courseware (MOOCs) are an online education tool that has gained a lot of popularity, especially in higher education institutions (HEIs). MOOCs offer a new alternative for education and can support lifelong learning, self-directed learning, and educational information which require for constant use. Studies on MOOCs are frequently found in HEIs, although there are still a lot of gaps in the available studies. From a theoretical perspective, little is known about which factors promote MOOC acceptance and use in online learning contexts. This study focus on examining empirical studies of MOOC acceptance and use and identifying factors affecting MOOC acceptance and use by applying the Extended Unified Theory of Acceptance and Use of Technology (UTAUT2). First, a review was conducted of empirical research publications on MOOC that had been published in 2 specialised journals between 2012 and 2021. Second, a critical analysis of 10 studies investigating factors aiding or impeding MOOC acceptance and use was conducted. The study revealed that among six constructs of the UTAUT2, "Hedonic Motivation" was the most important factor in influencing MOOC acceptance and use, while "Facilitating Condition" was the major barrier. This study also makes significant theoretical contribution by extending UTAUT2 with a new variable namely personal innovativeness (PI) in the domain of information technology (IT). In conclusion, limitations of the study were reviewed in detail, and recommendations for future research were given.

Keywords: Massive Open Online Courses, Higher Education Institutions, Extended Unified Theory of Acceptance and Use of Technology (UTAUT2), Acceptance and Use, Online Learning

Introduction

Online learning or e-learning calls for a better usage of online learning platforms in the 21st century learning environment where technologies such as Massive Open Online Courses (MOOCs) are used for a more extensive and effective learning experiences. Using technology increases the effectiveness of learning in all aspects of education and offers quality courses from top universities to any student in the world (Wang & Zhu, 2019). In facts, the COVID-19 pandemic made Educators from pre-school to university change their teaching practices into online environments (Blum-Smith et al., 2021). Higher education turned out to be in a better position as the platforms of MOOCs and LMS of universities are already used for various classes (Evseeva et al., 2020). At present, the use of MOOCs is not just a new technological solution but it become a significant change in existing university educational practices (Knox, 2016)

Using MOOCs to support teaching and learning process in higher education is very important. This is because MOOCs become as great online technology tools that can facilitate the learning process of any type of content (Hidalgo et al., 2020). MOOCs are categorised according to cMOOCs and xMOOCs. cMOOCs are founded based on the theory of connectivism which are decentralized, open-ended, and not bound to a particular online space while xMOOCs are laid on the behaviourist theory which are characterized by relying on a single platform, a well-specified instructional sequence, and the use of lecture videos and assignments (Littlejohn & Hood, 2018). Both types of MOOCs have their benefits and limitations. For cMOOCs, these type of MOOC are based on Connectivism Learning Theory where learning is to create, add and delete connections. In contrast to cMOOCs, xMOOCs are based on Behaviourism Learning Theory which learning resources are available to learners (Wu, 2019) and traditional e-learning courses organized by universities into different platforms (Hidalgo et al., 2020).

To understand the acceptance and use of MOOCs from a theoretical perspective, this study examined three well-known technology adoption models. The Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Extended Unified Theory of Acceptance and Use of Technology (UTAUT2). The TAM model assumes that the user's perceived usefulness and perceived ease of use are two major factors for technology acceptance. Despite a lot of research has been widely used by many researchers because it is considered a valid, robust and user-friendly model (Marangunic & Granic, 2015; Venkatesh & Davis, 2000), TAM has been criticised for primarily focusing on personal factors (Lee et al. 2003) despite having been tested with a wide variety of new technologies and showing that these two factors explain about 40% of the variance in intention to adopt a technology. To reduce these criticisms, Venkatesh et al., 2003 proposed the UTAUT model and declared that both personal and social factors were closely related in describing the acceptance of technology.

The UTAUT2 (See Table 1) is an integrated model used to identify users' acceptance of technology and focuses on four direct constructs that are performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC), and social influence (SC). These four constructs have been validated in numerous studies (Huang & Kao, 2015; Decman, 2015). Venkatesh et al., 2003 also identified four moderator constructs, namely age, gender, experience, and voluntary. After applying the UTAUT model (Venkatesh et al., 2003), UTAUT evolved in 2012 to UTAUT2 from the results generated using the UTAUT model. The UTAUT2 proposes four

constructs from the UTAUT model that are performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC), and social influence (SC) as well as three additional constructs hedonic motivation (HM), price value (PV) and habit (H) as precursors of behavioral intention and use behavior. Venkatesh et al., 2012 also proposes three moderator constructs, namely gender, age and experience.

The purpose of this study, therefore, was to provide a better understanding of the reasons for MOOC acceptance and use by students and learners. The study used the UTAUT2 as a framework for analyzing and classifying reasons for MOOC acceptance and use reported in previous empirical studies.

Table 1
Six Constructs of the Extended Unified Theory of Acceptance and Use of Technology

Construct	Description
Performance expectancy (PE)	"The degree to which an individual believes that using the system will help him or her attain gains in job performance" (Venkatesh et al., 2003)
Effort expectancy (EE)	"The degree of ease associated with the use of the system" (Venkatesh et al., 2003)
Social influence (SI)	"The degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003)
Facilitating condition (FC)	"The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003)
Hedonic motivation (HM)	"The fun or pleasure derived from using a technology (Van Der Heijden, 2004). It has been shown to play an important role in determining technology acceptance and use" (Venkatesh et al., 2012)
Habit (H)	"The extent to which people tend to perform behaviors automatically because of learning" (Venkatesh et al., 2012)

Methodology

As a start, the keywords related to the theme of Massive Open Online Courseware (MOOCs) accommodating open learning and MOOC acceptance for higher education were used to retrieve articles from seven online databases: the SCOPUS database and Google Scholar website. SCOPUS database provides a larger abstract and citation in various subject areas of language, arts, science and many more. Articles from SCOPUS database and articles from Google Scholar database were retrieved. The keywords used were 'MOOC', 'Massive open online courses, 'MOOC acceptance', 'higher education' and 'UTAUT2. The method of searching for relevant articles prior to the initial topic selected was done too. A total of 10 articles were accessed in this stage. This process is conducted by first, entering the document keywords that fit the theme of the topic. Second, the document titles, document type, authors, years and sources are given attention to. Related documents that appear in the appropriate portion of the databases are accessed by ensuring either it fit the theme of this study. Only peer-reviewed studies, published in a scholarly journal (magazines, conferences ad newspapers were excluded) between 2017 and 2022 are included in this review. The

retrieved studies were also needed to be published in English language only. The results of the information search are summarized in Table 2.

Table 2
The Total Articles Classified by the Databases

Databases	**Keywords**				
	MOOC	Massive open online courses	MOOC Acceptance	Online Learning	UTAUT2
SCOPUS	3	13	13	11	11
Google Scholar	2	4	4	5	5
Total	5	17	17	16	16

Selection of primary articles based on Table 2, comprises a total of 10 articles, retrieved from two databases: SCOPUS and Google Scholar. Therefore, inclusions and exclusions criteria were exercised to retrieve more relevant documents with good quality and fits the theme of the topic and to write a worthy critical review. First, publication years from 2017 and above were included and publications below the year 2017 were excluded to ensure the articles apply to most recent 21st century learning environment. Older articles may deal with older technology trends in education that may not be effective in this more modern age of learning.

Second, retrieved articles were ensured to be peer-reviewed. These articles offer valid research that are based on multiple experts' knowledge in discipline, which in return prevents falsified work from being adapted within an area of study. Articles that did not meet the peer-reviewed criterion are removed in this inclusion and exclusion criteria filter. Subsequent to this, the filter excluded all writings in the form of conference and book chapters as well.

Third, the inclusion and exclusion criteria filter helped remove articles where the studies did not focus on the education and technology field. Articles that did not evaluate visual media learning among learners in lower and higher institutions, explaining the strategies involved in visual media learning rather than the benefits of using visual media learning and focused solely on infographic learning were excluded. This filter helped the study to focus on a wider use of visual learning media instead of particular platforms such as infographics, audio visual aids and many more. This is because the visual media platform, Canva that is used as a topic of discussion in this study contains various visual aids for every type of learners. The Canva platform does not offer only a limited number and types of visual graphics and motions for individual and collaborative learning.

Lastly, the three research approaches involving qualitative, quantitative and mixed-method were included in this study. This is to ensure that the topic discussed has been effectively surveyed and analysed by previous researchers using various accepted methodologies.

Examining and Classifying Factors Affecting MOOC Acceptance and Use

After the application of these four inclusion and exclusion criteria : (1) publication years ranging from 2017 and above, (2) peer-reviewed articles, (3) studies focusing on a wider use of MOOCs acceptance for the higher education and (4) using the three research design

methodologies which are quantitative, qualitative and mixed-method research design methodology, a total number of 10 articles remained relevant to the theme of this study out of the seventeen articles searched initially. The 10 selected studies were critically reviewed, with special focus on key factors that promote or inhibit MOOC acceptance and use reported in their results. Subsequently, based on the UTAUT2 constructs (Performance expectancy; Effort expectancy; Social influence; Facilitating condition; Hedonic motovation; Habit) the authors developed six codes (PE, EE, SI, FC, HM, H) and classified the findings reported by each article. The details of the ten remaining articles are reported using a table as can be seen in Table 3. The table also shows three studies involving the themes being studied were found to have been conducted in Malaysia.

Table 3
Ten Articles Selected for the Study on MOOC Acceptance and Use using UTAUT2

Authors	**Journal**	**Variables Analyzed**	**Country**	**Data Collection Methods**	**Main Findings**
1) Meet, Kala and Al-Adwan (2022)	Education and Information Technologies	Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Hedonic motivation, Price value, Habit, Additional: Language competency, Teacher influence	India, Jordan	Online survey	Positive influence of price value, hedonic motivation, facilitating conditions, performance expectancy and effort expectancy on MOOC adoption.
2) Chaveesuk et al. (2022)	PLOS ONE	Performance expectancy, Effort expectancy, Absorptive capacity, Social influence, Facilitating conditions, Hedonic motivation,	Thailand, Poland	Structured questionnaire	Effort expectancy and culture significantly and positively influenced behavioral intention to use MOOCs in all three countries.

		Price value, Habit Additional: Social distancing, Culture, Absorptive capacity			
3) Goto and Munyai (2022)	The African Journal of Information Systems	Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Hedonic motivation, Price value, Habit	South Africa	Online survey	Social influence predicted the student behavioural intention, and that facilitating conditions and price value predicted the actual behavioural use of online learning.
4) Amid and Din (2021)	Journal of Personalized Learning	Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Hedonic motivation, Habit, Personal innovativeness	Malaysia	Questionnaires	Performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, and personal innovativeness in the IT domain have a significant impact on MOOC acceptance and use among university students.
5) Mohan, Upadhyaya and Pillai (2020)	Education and Information Technologies	Performance expectancy, Effort expectancy, Social influence,	India	Questionnaires	Habit has the most significant predictor of the intention to use MOOCs, signals the self-efficacy of

		Facilitating conditions, Hedonic motivation, habit, Behavior intention to use MOOC Additional: Contents of platform			the respondents due to continuous use of the digital platforms.
6) Tseng et al. (2019)	Interactive Learning Environments	Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Hedonic motivation, Price value	Taiwan	Online survey	Performance expectancy and social influence are two key drivers.
7) Nasef et al. (2019)	OpenInternationalJournal ofInformatics (OIJI)	Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Hedonic motivation, habit, Behavior intention to use MOOCs Additional: Educational value	Malaysia	Structured interview	This study Proposes perceived Educational Value as the measure of cost and benefit in MOOCs.
8) Mafraq and Kotb (2019)	ICIET	Performance expectancy, Effort	Saudi Arabia, Egypt	Online Questionnaires	The performance expectancy,

		expectancy, Social influence, Facilitating conditions, Hedonic motivation, Habit, Additional: Self-management			the effort expectancy, the social influence, the facilitating condition, and the hedonic motivation have insignificant effects on the behavioral intention of MOOCs
9) Huang (2018)	Walden Dissertations and Doctoral Studies	Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Hedonic motivation, Habit	China	Questionnaires	The performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, and habit significantly influenced social media use intention.
10) Lim, Tang and Ravichandran (2017)	IC4E	Performance expectancy, Effort expectancy, Social influence, Facilitating conditions, Hedonic motivation, Habit	Malaysia	Questionnaires	The most influential factor on the MOOCs Actual Usage was Intention to Enroll in MOOCs and the most influential factor on the Intention to Enroll in MOOCs was Habit.

Literature Review of Ten Empirical Studies

i) Factors Promoting MOOC Acceptance and Use

Among the factors that affected MOOC acceptance and use found in the literature review, performance expectancy, social influence, effort expectancy and habit were the factors that influenced individuals the strongest in using MOOCs (Chaveesuk et al., 2022, Meet, Kala & Al-Adwan, 2022; Mohan, Upadhyaya & Pillai, 2020; Tseng et al., 2019, Huang, 2018; Lim, Tang & Ravichandran, 2017). Performance expectancy and social influence are two key drivers in using MOOCS (Tseng et al., 2019). While, habit has the most significant predictor and

influential factor on the behavioural intention to use in MOOCs (Mohan, Upadhyaya & Pillai, 2020; Lim,Tang & Ravichandran, 2017). However, the effects of other UTAUT2 drivers on MOOC acceptance and use were inconclusive.

Others factors in the literature review such as educational value becomes as the measure of cost and benefit in MOOCS (Nasef et al., 2019). In MOOCs, value is perceived not through monetary costs and benefits but through how the student perceives the MOOCs provide benefits to them in terms of educational value. Students spend time and effort into MOOCs and expect a return of educational value. Therefore, educational value is defined as the cognitive trade-off between the perceived benefits of the applications and the time and effort spent on using them (Ain, et al., 2016), based on Price Value definition (Zheng, et al., 2015; Lee et al., 2003).

Social distancing, culture and absorptive capacity factors also can be used under the UTAUT2 model to explain the possible behavioral intention to use the MOOCs emphasizing social distancing, culture and absorptive capacity. The study adopted the UTAUT2 model and previous research to develop the conceptual framework, with an addition of other variables namely culture, social distancing, and absorptive capacity (Chaveesuk et al., 2022). Some of other factors in the literature review are tested the UTAUT2 model and do not have an impact on Behavioural Intention towards MOOC adoption. The factors such as language competency and teacher infuence do not have an impact on Behavioural Intention of Gen Z towards MOOC adoption (Meet, Kala & Al-Adwan, 2022).

Farooq et al., 2017 has found the extended UTAUT model (UTAUT2) as the most suited model to measure students' intentions of using IT with personal innovativeness (PI) in the domain of information technology (IT). A studies by Mohan, Upadhyaya & Pillai (2020), Lim, Tang & Ravichandran (2017), used the UTAUT2 model to identify learners' acceptance of MOOCs and has found that habit is the factor that influenced the behavioural intention to enrol in MOOCs the most. Another study by Meet, Kala & Al-Adwan (2022), analysing MOOC intentions using the UTAUT2 model did find that hedonic motivation is one of the most significant factors that influenced behavioural intention to use MOOCs. Thus, this study is using the extended UTAUT model (UTAUT2) as the most suited theoretical framework to fill this gap in the literature in regards to the variables of personal innovativeness (PI) and other UTAUT2 variables influencing the behavioural intention of using MOOCs.

ii) Applying Six Constructs of UTAUT2

As specified in the methodology section above, the factors promoting the acceptance and use of MOOCs reported by the 10 selected studies were classified using the UTAUT2 model.

Performance Expectancy

The most powerful factor promoting MOOC acceptance and use was "Performance Expectancy (PE)". This factor describes users tend to believe that MOOC acceptance and use (for students and learners) would help improve their performance. Performance expectancy refers to how the user expects a technology (e.g. online learning like MOOC) to be useful (Venkatesh et al., 2003). During the COVID-19 pandemic, online learning like MOOCs became helpful and useful for students because it was necessary to attend required online courses. This is the only way to complete the 2020 academic year for the majority of those taking

MOOCs. Fianu et al (2018), tested the construct of "Performance Expectancy (PE)" on MOOC acceptance and the analysis showed a positive effect on MOOC acceptance. Ariani et al (2019), also tested the construct of "Performance Expectancy (PE)" on the acceptance of mobile learning and the analysis showed that this construct produced a significant effect on the acceptance.

Effort Expectancy

The second most important factor for MOOC acceptance and use was "Effort Expectancy (EE)". Effort expectancy refers to the degree of belief that the technology under use will be easy to use and effortless. MOOCs programs are delivered through an online technology platform. Therefore, understanding of acceptance and use of MOOCs by users, including lecturers and students, expected usefulness of the technology platform. Previous studies have shown that the factor of "Effort Expectancy" affects the acceptance of MOOCs in three different faculties, namely the faculty of mechanical engineering, the faculty of technology management and the faculty of technology engineering (Al-Shami et al., 2018). Past studies also show that the factor of "Effort Expectancy" has a significant positive influence on acceptance in social media (Huang 2018).

Social Influence

The third factor promoting MOOC acceptance and use was "Social Influence (SI)". Social influence is a degree to which an individual perceives that important others believe he or she should use the new system or technology (Venkatesh et al. 2003). Decman (2015), defines social influence as the level of influence of other individuals (students, friends, lecturers) in the social environment and the individual's belief in the use of technology such as e-learning. There are past researchers who use the factor of "social influence" as "social norms" or "subjective norms" (Davis et al. 1989; Yuan et al. 2005). Social influence is a direct determinant of acceptance to use technology (Venkatesh et al. 2003). Assaker et al (2020), Arain et al. (2019) and Fianu et al. (2018) showed a non-significant influence of the construct of 'social influence' on 'behavioral intention'. However, the majority of previous studies prove that the factor of "social influence" has a significant positive influence on behavioral intention of various types of technology including social media (Huang 2018), e-learning systems (El-Masri & Tarhini 2017), Learning Management System (Raman & Don 2013), and mobile learning (Yang 2013).

Facilitating Conditions

"Facilitating Conditions (FC)" was the other factor that promoting MOOC acceptance and use. Facilitating conditions is the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003). Facilitating conditions is an environmental factor for an action to be easy (Im et al. 2011). Facilitating conditions is an objective factor in the environment that makes actions easy to achieve, provides support to users in case of need or difficulty and easy to control the environment (Venkatesh et al. 2003). Apart from that, support for access can also facilitate service when managing a system (Mazman & Usluel 2010). In this study, facilitating conditions refers to access facilities and technical infrastructure provided at universities to facilitate students accessing and using MOOCs for learning purposes. There are various facilities in providing social and academic needs such as access to internet facilities, having good interne'

and the cost of broadband is considered to facilitate the conditions for the use of technology for learning (Echeng et al. 2012).

Hedonic Motivation

"Hedonic Motivation (HM)" can be defined as the fun or pleasure derived from using a technology (Van Der Heijden, 2004). Hedonic motivation plays an important role in determining technology acceptance and use" (Venkatesh et al. 2012). Hedonic motivation was the other important factor that promoting MOOC acceptance and use. Hedonic motivation play an important role in determining the acceptance and use of a technology (Brown et al. 2004). Theoretically, hedonic motivation is a factor that influences the acceptance and use of technology to predict intentions in the study of Information Systems (Alalwan et al. 2015; Venkatesh et al. 2012; Brown and Venkatesh 2005), and in the context of online learning (Al-Gahtani 2016; Lewis et al. 2013). In this study, hedonic motivation refers to students who use the MOOC in learning and find it enjoying, fun and entertaining. Therefore, students become motivated to learn the topics through MOOC and these students tend to continue to use the MOOC.

Habit

Venkatesh et al (2012), defined "habit" as the extent to which individuals tend to perform behaviors automatically because of learning. Farooq et al (2017), stated that "habit" influence behavioral intentions towards the acceptance and use of consumer technology, such as e-learning. Habit was the other important factor that promoting MOOC acceptance and use. Research in the Information System (ICT) indicates that habit has a significant impact on the behavioural intention of using a technology (Lee at al. 2014). Habit is measured through the extent to which individual beliefs about behavior and actions become habitual (Limayem et al. 2007). In the context of this study, habit refers to students who have behaviors that encourage them to use MOOCs. Thus, those students are more likely to use MOOCs. Habit becomes the most influential factor on the behavioural intention to use in MOOCs (Mohan, Upadhyaya & Pillai, 2020; Lim,Tang & Ravichandran, 2017).

iii) Applying Personal Innovativeness

In addition to the six constructs of UTAUT2', one new construct incorporated into UTAUT2 which is "Personal Innovativeness (PI)" factor from the domain of information technology. Agarwal & Prasad (1998) defined personal innovativeness as "the willingness of an individual to try out any new information technology". In the field of information technology (IT), the term PI also refers to a person's personal attitudes that reflect his or her tendency to experiment independently and apply new information technology developments (Raaij & Schepers, 2008). PI is an important construct for the study of individual behavior toward innovation, which is an old tradition in the study of innovation diffusion spread in general. Research has indicated that personal innovativeness is the personal factor that has the most influence on digital informal learning (He & Zhu, 2017). This research proposes a new variable to the UTAUT2 model and introducing a new construct's function conceptual framework of MOOC acceptance and use as shown in Figure 1.

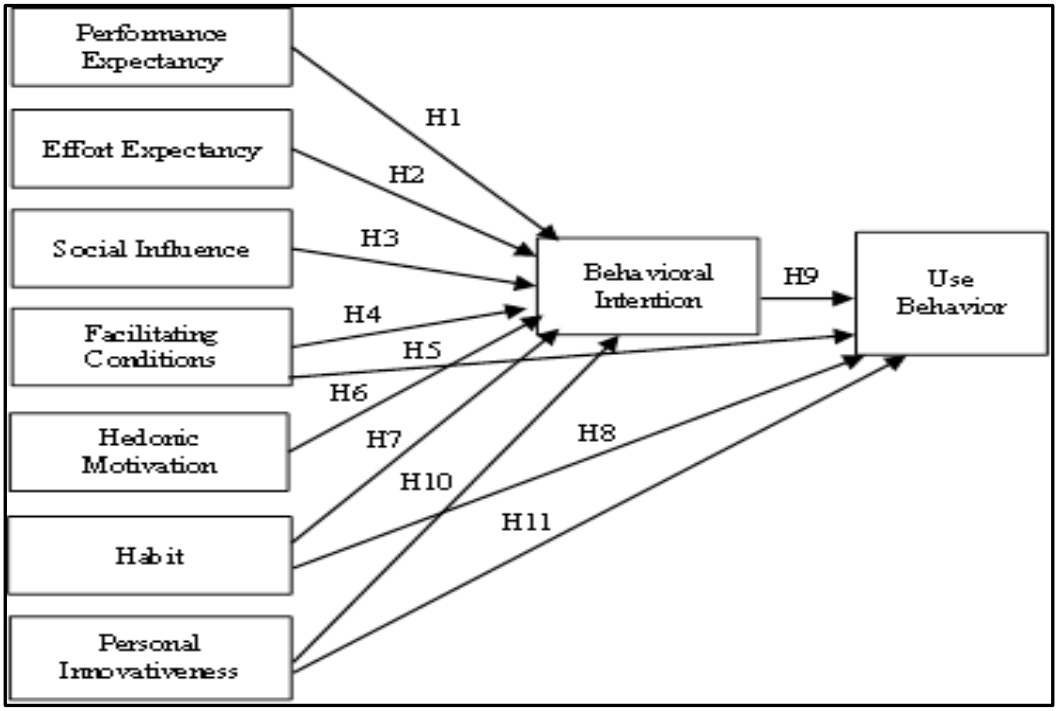

Figure 1. A Conceptual Framework of MOOC Acceptance and Use

The Way Forward

Based on the proposed conceptual framework, the author developed a framework or hypothesis model for testing and achieving the objectives. However, this framework can be further developed by including other constructs or variables that are appropriate to the researcher's research objectives in the future. The constructs or variables are taken from different theories and models, because there are different theories and models of technology acceptance and use. In addition, given the many factors that can influence the acceptance and knowledge of MOOCs, other factors can also be added either from the individual, organizational, technological, or environmental aspects. Future studies are also recommended to investigate the existing moderators in this study or new moderators that can be tested.

In order to develop the conceptual framework, a questionnaire instrument is modified based on previous studies (Rosseni Din 2018, Farooq et al. 2017, Zhong et al. 2017, Dutta et al. 2015, Venkatesh et al. 2012 and Venkatesh et al. 2003). A combination of research instruments from multiple researchers is used as this study combines UTAUT2 theory with the construct 'personal innovation' as well as a moderator from the UTAUT2 theory and a new moderator. The developed instrument was also tested for validity and reliability. Thus, this instrument can be used to study the acceptance and use of MOOCs among UA students in Malaysia. However, in order to conduct an in-depth study of all higher education institutions in Malaysia, a comprehensive instrument should be developed that is suitable for the study to be conducted.

Instead of focusing on the acceptance and use of MOOC to ensure quality education, we should shift the way we look at MOOC which have a potential for individual learning student. A proper conceptual framework and model of learning can provide a basic guide to build a

system for a more systematic course for learning and teaching purposes. Consequently, MOOC developers should strive to produce more quality MOOC. They should be aware of the nature of learning and how MOOC should appeal to students.

Conclusions

This paper examined factors influencing MOOC acceptance and use in recent empirical studies and analyzed them using UTAUT2 as a framework. This study presented what factors affect decisions in adopting or not MOOCs in the context of online learning in higher education. This study shows that the six components of the UTAUT2 model can help explain and determine the strength of predictors of learners' intentions to adopt MOOCs, but they do not provide the full of picture. The addition of one construct was needed to fully understand MOOC acceptance and use, were presented in a conceptual framework. This framework is intended as a basis for suggesting strategies appropriate to promote MOOC acceptance and use, in various online learning in higher education contexts. Based on UTAUT2, this study presented findings on university students' acceptance and use of MOOCs, as well as introducing and verifying a new construct's function, personal innovativeness (PI). This finding suggests more research is needed regarding online learning platforms in the 21st century learning environment such as MOOC and others online learning for a more extensive and effective learning experiences. This study has limitations and results should not be interpreted or applied generally. First, no raw data from any study was available to the researchers for further analysis or verification of findings. The study solely looked at published articles. Based on the conclusions and interpretations provided by the nine research that were chosen, all assumptions were made. Additionally, our analysis only included a small number of studies that concentrated on a single type of MOOC analysis. More empirical investigations spanning a wider range of topics are required for future research.

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