A Structural Model of Factors Influencing Behavioural Intentions of Students to Use E-Learning in Malaysia

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Abstract

When the Malaysian government imposed the Movement Control Order (MCO) on 18 March 2020 to deal with Covid-19, universities had no choice but to replace physical classes with e-learning classes. This study investigated the influence of five factors, perceived usefulness, perceived ease of use, social influence, hedonic motivation and self-efficacy, on students' behavioural intentions to use e-learning in Malaysia during the MCO. Partial least squares analysis of 238 students from three Malaysian universities revealed that perceived usefulness, perceived ease of use, hedonic motivation and social influence together explained 53.7% of the variance in e-learning. Nevertheless, self-efficacy did not contribute directly or indirectly, to intentions to use e-learning. The study also confirmed the role of perceived usefulness as a mediator for hedonic motivation and social influence. Theoretically, this study has filled a gap in the literature on e-learning in Malaysia and demonstrated the applicability of an eclectic approach that combines variables from different theories. Findings from this study imply that policymakers, university staff and developers of e-learning systems should ensure that e-learning systems are designed such that their perceived usefulness and ease of use can attract more students to use them effectively, even in the post-pandemic era. Furthermore, more efforts are needed to ensure e-learning is fun-filled, exciting, and fulfilling rather than difficult and tedious. Social influence is also crucial in supporting the success of e-learning. In this context, the role of professors, university administrators, parents and friends is paramount in providing guidance and making sure that students can benefit fully from e-learning.

Keywords*:* E-learning, perceived usefulness, perceived ease of use, social influence, hedonic motivation.

1.0 Introduction

E-learning involves applying electronic technologies to access learning materials conveniently (Vululleh, 2018). Therefore, E-learning is an essential part of the learning process (Pituch & Lee, 2006). E-learning is also a versatile online communication platform. It allows learners to gain access to course content, instructor assistance, program information, file exchange systems and education materials via slideshows and videos through technology without the time and location restraints (Martin & Kellermanns (2004) and Ngai, Poon & Chan (2007). Moreover, e-learning could foster communication between instructors and students through the discussion forum when it allows instructors to conduct live virtual classes.

Higher education in Malaysia confirmed the importance of e-learning in Malaysia when the Ministry of Education set up the Educational Technology Division (Azhari & Long, 2015). The progress in technology and wide internet availability has contributed to the growth of e-learning (Goi & Ng, 2009). The Open University of Malaysia (OUM) launched the first distance learning institution in Malaysia by providing e-learning, in-person tutorials, and self-directed learning (Abas, Chng & Mansor, 2009). OUM records instructors' slides and clips of video by using video streaming during e-learning classes to promote a better understanding of the subject (Abas & Khalid, 2007). Methods such as Massive Open Online Courses (MOOCs) offer broad and deep topic options without charging. The official MOOC platform, OpenLearning.com, offers e-learning to Malaysia's public and private tertiary education institutions. Many students in Malaysia have taken MOOCs.

Christensson (2018) found that colleges and universities in Malaysia and worldwide started using Moodle to provide a systematised interface for online learning without charging. It allows educators to manage courses, conduct lessons, and interact with other lecturers, professors, and students. In contrast, students can access videos and documents, take quizzes, review class activities from the calendar, hand over assignments and interact with classmates. Thus, e-learning is a very convenient and suitable learning approach.

Applying information and communication technologies (ICTs) in an e-learning process can lead to high flexibility and responsiveness in the learning environment (Valencia-Arias, Chalela-Naffah, & Bermúdez-Hernández, 2018). Instructors can deliver teaching

materials to audiences worldwide without time and space constraints. Self-learning can be fostered through e-learning when students can access learning materials fulfilled through multimedia content. For instance, e-lecture notes, e-exercises and e-quizzes support their self-learning effectively. Moreover, e-learning helps to cut costs in training, travel, facilities and lecture theatre and tutorial class, materials in printed form, human resources and information explosion (Bhuasiri, Xaymoungkhoun, Zo, Rho & Ciganek, 2012). Azhari and Long (2015) mentioned that e-learning reduces university infrastructure costs. Students no longer need to attend physical classes when they have high access to learning materials from their home or anywhere via e-learning.

On the other hand, the disadvantages of e-learning have also been highlighted in a few studies. Cantoni, Cellario & Porta (2004) posited that e-learning has a high initial cost which requires educators to learn new teaching techniques and learners to nurture self-discipline. Additionally, security issues include hacking and cyber-criminals on online learning systems that have affected learners and service providers (Ramim & Levy, 2006). For instance, Gunasekaran, McNeil & Shaul (2002) stress that a big challenge existed in authenticating test-takers since instructors are unable to supervise exam takers during online testing. Childs, Blenkinsopp, Hall and Walton (2005) and Welsh, Wanberg, Brown and Simmering (2003) highlighted that implementation issues include hardware expenses, software authorisations, education material development, tools maintenance, and preparation.

1.1   Covid-19 and The Rise of E-Learning

E-learning has become more critical due to the coronavirus pandemic, thus making physical classes challenging to implement (Sun, Tang & Zuo, 2020). Universities in Malaysia resorted to e-learning during the pandemic when the government imposed the Movement Control Order (MCO) on 18 March 2020 (Bunyan, 2020). Since the suspension of physical classes in universities during the MCO, universities had no choice but to conduct classes online.

The expertise and experience developed during this pandemic reflect that e-learning will continue to be more critical than in the pre-pandemic era. Universities used E-learning before the spread of Covid-19 as an alternative teaching method. However, the outbreak of Covid-

19 has made it a vital tool for universities (MIDA, 2020). The conduct of learning and even assessments have been executed online during the pandemic (Rajaendram, 2020). Several factors are needed to facilitate e-learning, such as increasing the availability of computers, smartphones, good internet connections, streaming channels and television (Khazanah Research Institute, 2020). Nonetheless, the most crucial issue is whether students' intention to use e-learning. Therefore, universities need to know why students prefer e-learning or otherwise.

1.2   Problem Statement

Students often encounter several difficulties in conventional teaching and learning systems with physical classes. Among them are access to learning materials far from the university, high time consumption in collecting relevant data and information, and high tuition fees. Notwithstanding, e-learning has the potential to overcome these aforementioned limitations.

While there are studies on the factors contributing to e-learning in different countries, the number of related studies regarding antecedents of e-learning is limited in the Malaysian context. Hence, this study will contribute to the literature on e-learning, emphasising factors that influence students to use e-learning in Malaysian universities.

Although universities used e-learning before the emergence of Covid-19 as an alternative teaching method, the outbreak of Covid-19 has made it a vital tool for universities. Furthermore, the efforts made to utilise e-learning during the pandemic indicate that its use will continue even after the pandemic.

While universities need to provide the necessary facilities and environment to facilitate e-learning, students' intention to use e-learning is one of the most critical issues that deserve attention. This study examined the influence of five factors affecting students' intention to use e-learning: perceived usefulness, perceived ease of use, social influence, hedonic motivation, and self-efficacy.

2.0   Literature Review

2.1   The Technology Acceptance Model (TAM)

Three of the variables in this study, perceived usefulness (PU), perceived ease of use (PEOU) and behavioural intentions (ITU),

originate from the Technology Acceptance Model (TAM) (Davis, 1989). Davis (1989) proposed that PU and PEOU are two fundamental factors determining users' attitudes toward their behavioural intentions (ITU) in the TAM model.

Perceived Use (PU) is a person's belief that a specific technology would enhance work achievement. Concurrently, PEOU is the extent to which a user trusts he or she is free from difficulty when using a system. Both determinants are assumed to be affected by individual attitudes. TheTAM has been supported by findings on technology adoption (Davis, Bagozzi & Warshaw, 1989; McCoy, Galletta & King 2007; Fusilier, Durlabhji & Cucchi, 2008). Meanwhile, other studies have suggested the need to include other factors not reflected in this model such as computer self-efficacy, technological complexity, and environmental and organisational support to elucidate the underlying reasons for individuals to adopt technology (Teo, 2009). Hence, this study extends this model by adding two factors from the Unified Theory of Acceptance and Use of Technology 2, namely, social influence (SI) and hedonic motivation (HM).

Perceived usefulness (PU) is how users' faith in using a particular technology can help boost their productivity in academic or job performance. *Useful*ness refers to the benefits of using the system or technology (Davis, 1989). In e-learning, PU thus refers to situations where users can save time, enhance performance, and obtain greater control over work activities (Doll, Hendrickson & Xiandong, 1998). Furthermore, Davis (1989) highlighted that users who perceived the system as high in PU would be more likely to use it. In other words, PU plays a significant role as users accept an application primarily due to the functions it can execute for them. Consequently, PU could influence their behavioural intentions to accept a system. However, in this study, PU is also tested as a mediator between PEOU, SI, HM, self-efficacy (SE) and behavioural intention to use (ITU) e-learning, as highlighted below.

Perceived ease of use (PEOU) is users' faith that they are free from complications when using a specific technology (Davis, 1989). Likewise, Salloum and Shaalan (2018) highlighted that PEOU is the simplicity to use a specific technology. In e-learning, PEOU is the degree to which a user has faith in using an online learning system that is common, understandable, easy to interact with, and flexible (Hammouri & Abu-Shanab, 2018). Ansong, Boateng and Boateng

(2017) mentioned that PEOU means that users require little or no assistance and feel comfortable using an e-learning system.

2.2   Unified Theory of Acceptance and Use of Technology (UTAUT) and UTAUT 2

In order to further improve the TAM, Venkatesh, Morris, Davis and Davis (2003) proposed UTAUT and later UTAT 2 (2012), comprising new variables not found in the TAM. These variables included social influence (SI) and hedonic motivation (HM). Therefore, this study includes SI and HM to explain why students adopt e-learning in universities.

Social influence (SI) refers to how significant individuals feel that other people believe they should use something new. Venkatesh et al. (2003) stated that SI influences people through the opinions of significant others to use technology. Many studies have discussed SI in shaping ITU, including Teo & Noyes (2014), Tarhini, Teo & Tarhini (2015), Sharma et al. (2015) and Alzeban (2016).

Hedonic motivation (HM) refers to one's perceived enjoyment and perceived entertainment (Venkatesh, Thong & Xu, 2012). A learner's enjoyment of online learning, learning tactics, learning experience and engagement flow can relate to HD (Padilla-Meléndez, Del Aguila-Obra, & Garrido-Moreno, 2013; Barak, Watted & Haick, 2016). Meanwhile, the contents, images, colours, sounds and layout are significant elements in HM to attract adoption (Van der Heijden, 2004).

2.3   Social Cognitive Theory

The variable of self-efficacy in the social cognitive theory has been shown to influence students' learning ability. Self-efficacy is the personal judgment of how well one can perform specific courses of action to deal with different situations (Bandura, 1997).

In the context of this study, the focus is on how cognitive factors influence individual behaviour through the individual's self-efficacy, which is the ability to use online learning systems effectively in following the courses conducted by the universities.

Previous research has demonstrated that self-efficacy with computers and online learning systems positively impacts intentions to use computers and online systems (Compeau & Higgins, 1995; Mew & Honey, 2010). Meanwhile, other studies have urged caution (Marakas,

Yi & Johnson, 1998), stating that results were either equivocal or contradictory.

3.0   Methodology

3.1   Conceptual Framework and Hypotheses Development

Figure 1 depicts the conceptual framework employed in this study based on the above discussion. The figure reflects that PEOU, SI, HM, and SE are exogenous variables, PU is the mediating variable, and ITU is the endogenous variable.

The findings of Al-Fraihat, Joy, Masa'deh and Sinclair (2020), Seddon (1997) and Al-Sabawy (2013) have proven that PU could influence users' satisfaction positively. If students see the e-learning system as useful, they will adopt it. However, Song and Kong (2017) found that PU has no relationship with behavioural intention. This finding was due to the narrow range of topics covered in the e-learning platform and the lack of digital resources on the current topics that were unable to improve their learning performance. This statement is consistent with the findings of Kang and Shin (2015) in a study of e-learning acceptance at Korea University. Furthermore, students perceived that PU is less important than PEOU. It could be that students were unable to engage adequately with their instructors through the system, especially when they face difficulties in technical aspects during class.

Cigdem and Ozturk (2016) highlighted that PU directly influences BI. When learners believe that a particular system is beneficial, they are more likely to adopt it for learning purposes. Masrom (2007), in a study of the University Technology of Malaysia (UTM), also found that students were ready to accept e-learning systems that bring them advantages. Abdullah, Mohd Kamal, Azmi, Lahap, Bahari and Din (2018) reported that PU had a direct positive impact on online hotel booking. Moreover, the finding that PU influences ITU to accept a system is supported by Islam (2011), Islam (2013), Sumak, Hericko and Pusnik (2011). Therefore, the hypothesis is that:

H1:   Perceived usefulness (PU) positively affects behavioural intention to use (ITU) e-learning.
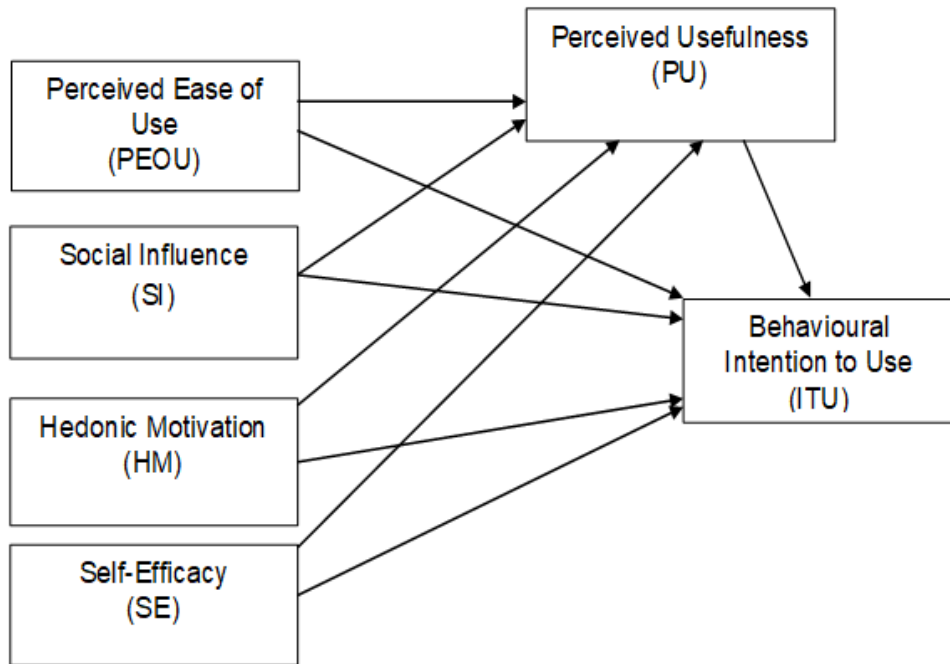
Figure 1 : Conceptual Framework of the Study

The study by Boateng, Mbrokoh, Boateng, Senyo and Ansong (2016) at the University of Ghana revealed that PEOU had no relationship with ITU e-learning. Viewed from the students' perspectives, it indicates that the ease of operating an online learning system will not influence ITU. Purnomo and Lee (2013) supported this lack of relationship based on an e-learning study in Indonesia. On the other hand, Bhuasiri et al. (2012), Islam (2013), Motaghia (2013) and Namisiko, Munialo and Nyongesa (2014) have recognised PEOU as one of the determinants in the TAM.

PEOU influences ITU directly (Salloum & Shaalan, 2018). Hence, the developers should design the online learning system to ensure it offers advantages to all learners without adding complications to the system (Cheng, Wang, Moorman, Olaniran & Chen, 2012). Consequently, students will be more willing to accept online learning when little or no effort is required to use the system (Cheng et al. (2012). Similarly, Cooper and Zmud (1990) found that a system with little technical skills and operational efforts will gain user acceptance. Therefore, the hypothesis is that:

H2:   Perceived ease of use (PEOU) positively affects ITU e-learning.

Research findings support an indirect effect of PEOU on behavioural intention to use (ITU) e-learning through PU. Mohamed and Abdul Karim (2012) found that PEOU had a positive relationship with PU, but this did not translate into a relationship with ITU e-learning. On the other hand, Ong, Lai and Wang (2004) demonstrated that PEOU has an indirect impact on BI to use e-learning through PU. Cheung and Vogel (2013) and Lee (2006) also reported the same relationship in their studies. Ashrafi, Habiba and Alam (2020) found that PU acted as a mediator in the relationship between PEOU and intentions to use ride-sharing. Therefore, the hypothesis is that:

H2A: PEOU positively affects ITU e-learning mediated by PU.

Though studies by Mathieson (1991) and Davis (1989) did not find any relationship between social influence and intention to use, other authors found significant relationships between the two variables. For example, Hernandez, Montaner, Sese and Urquizu (2010) revealed that social influence had a significant impact on attitude towards and use of ICT tools. Similarly, Park (2009) posited that subjective norms had an impact on student intention to use e-learning. See and Goh (2020) also discovered that social influence positively influences the adoption of mobile payments in Malaysia.

The relationship of SI with ITU is developed when an individual is significantly influenced by others who think that the individual should act in a certain way (Ajzen & Fishbein, 1980). Moreover, if the information of the reference group is reliable, SI influences BI to use IT (Compeau & Higgins, 1995). Therefore, the hypothesis is that:

H3:   Social influence (SI) positively influences ITU e-learning.

Research findings also supported an indirect effect of SI on behavioural intention (BI) to use e-learning through PU. For example, Park, Nam & Cha (2012) found that subjective norms, similar to social influence, positively affected perceived usefulness and translated into mobile learning attitude. Similarly, Elkaseh, Wong & Fung (2015) concluded that social influence positively affected PU, which translated into BI to use e-learning. Ismail, Razak, Zainol & Sallehudin found that

subjective norms or social influence positively influenced mobile marketing services (2019). Therefore, the hypothesis is that:

H3A: SI positively correlates with ITU e-learning mediated by PU.

Hedonic Motivation (HM) can link with a learner's perception of the usefulness of online learning. For instance, it facilitated learners' examination of online information. In contrast, TAM, which focuses on extrinsic motivation, could not explain learner behaviour (Saadé, Nebebe & Mak, 2009).

If there are appealing, well-designed and exciting e-learning courses, users considered them useful (Roca & Gagné, 2008). Consequently, learners motivated by images and sights in HM will develop the intention to use online learning. Thus, HM is considered a determinant of ITU. In the Malaysian context, Osman and Leng (2020) found that HM positively predicted the adoption of mobile banking among Malaysian students. As such, the hypothesis is that:

H4: Hedonic motivation (HM) positively impacts ITU e-learning.

Research findings depicted a mediated effect of HM on ITU e-learning. For instance, Liu and Li (2011) found that HM had positive effects on PU, but this did not translate into BI. However, Lim, Lim and Heinrichs (2005) reported that HM or perceived enjoyment had a positive impact on PU, which translated into e-purchase. Similarly, Al-Rahmi, Yahaya, Aldraiweesh, Alamri, Aljarboa Alturki and Aljeraiwa (2019) found that perceived enjoyment positively impacted PU and resulted in BI. Therefore, the hypothesis is that:

H4A: Hedonic motivation (HM) positively impacts ITU e-learning mediated by PU.

Hsia, Chang and Tseng (2014) demonstrated that computer self-efficacy had a significant direct effect on PU and behavioural intentions. Furthermore, Chang and Tung (2008) found that computer self-efficacy was critical for students' intentions to use online learning websites. Therefore, the hypothesis is that:

H5: Self-efficacy positively impacts behavioural intentions to use (ITU) e-learning.

In terms of indirect relationships, Pituch and Lee (2006) found that self-efficacy did not contribute significantly to supplementary learning or distance learning when mediated by PU.

Lee and Mendlinger on the other hand (2011) found that perceived self-efficacy and perceived usefulness had positive relationships, contributing to online learning acceptance and satisfaction. Furthermore, Chuo, Tsai, Lan and Tsai (2011) produced evidence to show that self-efficacy led to perceived usefulness, which is positively related to usage intention. Finally, Ong et al. (2003) showed that computer self-efficacy is related to perceived usefulness. Furthermore, perceived usefulness had positive effects on behavioural intention to use. As such, the hypothesis is that:

H5A: Self-efficacy positively impacts behavioural to use (ITU) e-learning mediated by PU.

3.2 Sampling

Non-probability convenient sampling was employed in this study. An electronic link was sent to three Malaysian universities to collect information on e-learning relevant to the study. The first section of the survey form comprised demographic variables such as age, gender, level of education, duration of computer use, and frequency of use of online tools. The second section contained five-point scale items on the independent and dependent variables. A total of 250 forms were collected. Editing discovered that 12 survey forms contained many omissions and some illogical answers to be used in the analysis. They were therefore excluded from the analysis, resulting in 238 respondents included in the final analysis.

Measures were taken from published sources. The first section of the survey form consisted of demographic variables such as age, gender, level of education, duration of computer use, and frequency of use of online tools. The second section contained five-point Likert scale items on the independent variables of PU, PEOU, SI, HM, and SI. Higher scores on the Likert scale indicate a higher level of the measured items.

The five items on PU and PEOU were modified from Davis et al. (1989) and Chen, Lin, Yeh and Lou (2013). The four items on SI and HM were modified from Tarhini, Masa'deh, Al-Busaidi, Mohammed and Maqableh (2017). The three items on perceived behavioural control

(PBC) were adapted from Hua and Wang (2019) with little modification. Finally, the four items on behavioural intentions to use (ITU) were modified from Tarhini et al. (2017) and Chen et al. (2013).

3.3 Respondents' Profile

Most of the respondents were females (60.9%; N = 145) while 39.1% were males. A higher proportion belong to the 18-20 age group (51.3%; N = 122), followed by those aged between 21 to 23 years old (37%; N = 88), and 24-26 years old (7.6%; N = 18). In terms of educational qualification, 12.6% of the respondents (N = 30) possessed foundation level, 80.3% (N = 191) had a bachelor's degree while only 7.1% (N = 17) had a master's degree. Meanwhile, a higher proportion of the respondents (80.7%) had more than five years of computer experience. Most respondents used online learning tools daily (42.4%; N = 101), and 37% (N = 88) used such tools occasionally while 4.2% (N = 10) rarely used e-learning tools

SMART PLS was employed to perform the measurement model and then the structural model to test the hypotheses in this study.

3.4 Measurement Model

There are three primary assessment criteria in the measurement model for reflective indicators: internal consistency reliability, convergent validity, and discriminant validity. The internal consistency reliability was demonstrated through composite reliability. Convergent validity was established through factor loadings and average variance extracted (AVE). Table 1 shows that the composite reliability values were above 0.70, thus achieving internal consistency reliability.

Next, discriminant validity, which measures the uniqueness of a construct differentiating it from other constructs, was assessed using the Heterotrait-Monotrait (HTMT) Ratio. According to Kline (2011), the HTMT ratio should not exceed 0.85 to be acceptable. As shown in Table 2, all the values were below 0.85; therefore, this study achieved discriminant validity.

3.5 Hypothesis Testing

The structural model showing the relationships among the exogenous and endogenous variables was estimated using SMART-PLS, and the results are presented in Table 3.

Table 1 : Results of the Measurement Model

Factor	Item	Factor loading (>0.708)[b]	AVE(>0.50)[b]	Composite Reliability (CR) (>0.70)[b]
HM	HM1	0.898	0.776	0.933
	HM2	0.915		
	HM3	0.903		
	HM4	0.803		
PEOU	PEOU1	0.758	0.630	0.894
	PEOU2	0.708		
	PEOU3	0.795		
	PEOU4	0.837		
	PEOU5	0.861		
PU	PU1	0.854	0.685	0.897
	PU2	0.865		
	PU3	0.795		
	PU4	0.795		
SE	SE1	0.868	0.672	0.891
	SE2	0.858		
	SE3	0.785		
	SE4	.764		
SI	SI1	0.824	0.610	0.862
	SI2	0.752		
	SI3	0.787		
	SI4	0.760		
ITU	ITU1	0.827	0.679	0.894
	ITU2	0.745		
	ITU3	0.866		
	ITU4	0.853		

Note: HM = Hedonic motivation. PEOU = Perceived ease of use. PU = Perceived usefulness. SE = Self-efficacy. SI = Social influence. ITU = Intentions to use.
[b] Recommended threshold values. AVE = Average variance extracted

3.6   Findings

The results showed that the combination of the various variables from TAM, UTAT, and social cognitive theory explained 53.7% of the variance in intentions to use e-learning. The direct effects of the variables on intentions to use e-learning are shown in Table 3. PU was the most influential direct variable with a coefficient of 0.363 and significant at the 0.001 level. This result is consistent with the findings

of Cigdem and Ozturk (2016), Islam (2013), Sumak et al. (2011) and Masrom (2007). **Hence, H1 was supported.**

Table 2 : Discriminant Validity Based on HTMT Results

	HM	ITU	PEOU	PU	SE
HM					
ITU	0.653				
PEOU	0.537	0.572			
PU	0.611	0.746	0.468		
SE	0.493	0.430	0.748	0.401	
SI	0.651	0.717	0.660	0.646	0.725

Note: HM = Hedonic motivation. PEOU = Perceived ease of use. PU = Perceived usefulness. SE = Self-efficacy. SI = Social influence. ITU = Intentions to use.

Table 3 : Results of Hypotheses Tests

Hypotheses	Path	Path Coefficient	Results
Hypothesis 1	PU ➡ ITU	0.363***	Supported
Hypothesis 2	PEOU ➡ ITU	0.184**	Supported
Hypothesis 3	SI ➡ ITU	0.239**	Supported
Hypothesis 4	HM ➡ ITU	0.198**	Supported
Hypothesis 5	SE ➡ ITU	-0.099	Not Supported
Hypothesis 2A	PEOU ➡ PU ➡ ITU	0.036	Not Supported
Hypothesis 3A	SI ➡ PU ➡ ITU	0.116***	Supported
Hypothesis 4A	HM ➡ PU ➡ ITU	0.122***	Supported
Hypothesis 5A	SE ➡ PU ➡ ITU	-0.018	Not Supported

Note: HM = Hedonic motivation. PEOU = Perceived ease of use. PU = Perceived usefulness. SE = Self-efficacy. SI = Social influence. ITU = Intentions to use.
Note: *** <0.001 ** <0.01 *<0.05

Next, PEOU had a significant direct effect on BI to use e-learning. **Thus, H2 was supported.** If users believe they can operate an e-learning system efficiently, they will probably use it. This finding was confirmed by Salloum and Shaalan (2018) at the British University in Dubai, whereby PEOU influences BI directly. Cheng et al. (2012) also supported the event by reporting a significant interaction between students and an online learning system. Thus, developers should develop an *easy-to-use* e-learning system without increasing the complexity to ensure students apply little or even no effort. Conclusively, users would accept an online learning system if they can

perform their tasks easily using a system requiring less technical skills and operational efforts (Cooper & Zmud, 1990).

SI also has direct effects on intentions to use e-learning. This finding is consistent with the reports of previous researchers like Teo and Noyes (2014), Tarhini et al. (2015), Sharma et al. (2015) and Alzeban (2016). **Hence, H3 was supported.**

Another independent variable with a direct influence on intention to use e-learning was HM, with a coefficient of 0.198 and significant at the 0.01 level. The e-learning courses that were appealing, attractive and fascinating increased students' behavioural intentions to use them (Venkatesh et al., 2012). Therefore, system developers should design e-learning systems that emphasised pleasant content, dynamic images, colours, sounds, and attractive visual layouts to increase users' interest (Van der Heijden, 2004).

This finding on HM was also supported by Tarhini et al. (2017) at Australian Catholic University, where HM produced intentions to use e-learning. Balog and Pribeanu's (2010) study in Bucharest highlighted that elements, such as attractive exercises, pleasurable learning, and exciting system make users attracted to use e-learning. Karels (2018) highlighted that MOOCs' fun and joy elements could influence users' BI. **Thus, H4 was supported.**

However, **H5 was not supported** as self-efficacy (SE) did not contribute to intentions to use e-learning. In other words, the influence of SE was weaker compared to other variables investigated in this study. Next, Table 3 shows the mediated or indirect effects. Likewise, PEOU did not positively impact intentions to use mediated by PU. This finding contradicts those of Ong et al. (2004), Cheung and Vogel (2013), and Lee (2006). **Thus, H2A was not supported.** On the other hand, the relationship between SI and intentions to use was mediated by PU. This result aligns with previous findings of Park et al. (2012) and Elkaseh et al. (2015). **Thus, H3A was supported**.

The present study also supports the mediation of HM and intentions to use by PU, which was consistent with previous research by Lim et al. (2005) and Al-Rahmi et al. (2019). **Thus, H4A is supported.**

Finally, H5A was not supported. This finding was similar to that of Pituch and Lee (2006), who found that self-efficacy did not contribute significantly to supplementary learning or distance learning when it was mediated by PU.

4.0   Discussion

Four contributions of this study are notable. First, this study has filled a gap in the literature on understanding e-learning in the Malaysian context, especially in the post-covid 19 era. Researchers must pay more attention to e-learning in the future. Secondly, this study indicated the most critical variables in contributing to e-learning. Developers of e-learning systems must ensure that the PU and PEOU of their e-learning systems can attract students to use them more frequently.

In terms of hedonic motivation, developers of e-learning should introduce features that will enhance fun and entertainment to draw more students to use e-learning. Learning does not have to be difficult and tedious but rather fun-filled, exciting and fulfilling. Social influence is also crucial in ensuring the success of e-learning. In this context, the role of lecturers, professors, university administrators, parents and friends is paramount in providing guidance and making sure that students can benefit fully from e-learning.

The findings are significant to policymakers and developers of e-learning systems due to the increased importance of e-learning in the post-pandemic period. It is unlikely universities can ever rely entirely on the physical delivery of learning anymore in the post-pandemic era. The investments of universities in e-learning during the pandemic will continue to benefit students in the future, provided e-learning systems are useful, easy to use, frequently used, and fun to use. If e-learning was just an option in the past, it is now a must for all universities.

Thirdly, the study confirmed the importance of perceived usefulness (PU) as a mediator besides being the most influential direct predictor of intention to use e-learning. Thus, developers of e-learning systems must ensure that their systems are helpful to their users.

Fourthly, this study highlighted the crucial role of direct and mediated effects in understanding the intention to use e-learning. Hedonic motivation (HM) and social influence (SI) had mediated effects through PU but not perceived ease of use (PEOU) and self-efficacy (SE).

This study has certain limitations. Firstly, it covered only students in three universities. Many other segments of the population were considered in this study. Future research should also cover other population segments such as managers, engineers, employees, lawyers, lecturers and professors, which were taken into account in this

study as their perspectives may differ in the workplace compared to students in universities. Moreover, the older generation should be considered in future research since e-learning may face more obstacles from older people who are less computer-inclined.

Since this study applied only quantitative analysis, a more nuanced view of the proposed topic was not generated. Hence, the study could not probe more deeply into the students' motivations. Future research might combine quantitative and qualitative research to obtain a more comprehensive view of the topic. This mixed method could be achieved by adding some open-ended questions in surveys, interviews, discussions or focus groups. Such a study would be more balanced and reach a greater depth of understanding.

This study was a cross-sectional research design, but a longitudinal study extending over a more extended period would enhance the validity and provide more conclusive evidence.

Other variables that were not considered in this study, such as information and incentives, availability and cost of computers, system interactivity, and internet speed, might be included in future research to increase the explanatory power of the variables in the study.

5.0   Conclusion

The results in Table 3 revealed that perceived usefulness (PU), perceived ease of use (PEOU), hedonic motivation (HM) and social influence (SI) had direct effects on intentions to use (ITU) e-learning, and HM and SI had mediated effects on ITU through PU. Meanwhile, self-efficacy (SE) did not have a direct or mediated relationship with ITU e-learning This finding contradicts the result of previous studies (Compeau & Higgins, 1995, Mew & Honey, 2010), which might be probably related to the other variables such as PU, PEOU, SI and HM as they were more influential than SE in the Malaysian context of this study. Moreover, more than 98% of the respondents of the sample in this study were younger than 29 years old and are generally computer savvy. Thus, it is not surprising that SE in online systems did not emerge as a direct or indirect predictor of intentions to use e-learning.

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