Intention to Continue Using Online Learning among Malaysian University Students

Lubna A. Hussein[1*], Mohd Faiz Hilmi[2]

[1 2] School of Distance Education, Universiti Sains Malaysia,
11800 Penang, Malaysia
lubnafatlawi@gmail.com
faiz@usm.my
*Corresponding Author

https://doi.org/10.24191/ajue.v18i4.20009

Received: 23 July 2021
Accepted: 1 September 2022
Date Published Online: 7 October 2022
Published: 7 October 2022

Abstract: Online learning acceptance and continuance by students is crucial for Malaysia's national agenda of 2015-2025 in making the transition to globalized online education. Moreover, online learning is deemed important in educational institutions as universities have been forced to close their doors upon the sudden outbreak of the COVID-19 pandemic. However, this sudden change in the delivery of curriculum tends to raise student's concern of their ability to fulfil the demand of the curriculum, possibly hindering students' intention to continue online learning. Hence, the goal of this study is to better understand learners' intention to continue using online learning by looking into its influencing factors. Using the Technology Acceptance Model and PLS-SEM analysis on a sample of 251 respondents, findings indicate that curriculum is a significant factor in addition to perceived usefulness and perceived ease of use. Thus, to encourage students' intention to continue online learning, among others, it is recommended that steps be made by the university and faculty for enhancing existing curriculum and improving curriculum online delivery towards strengthening students' belief of their curriculum fulfilment through online learning.

Keywords: COVID-19 pandemic, Curriculum, Online learning, TAM Model.

1. Introduction

Online learning encompasses a range of technologies such as the worldwide web, email, chat, new groups and texts, audio and video conferencing delivered over computer networks to impart education. It has been widely known that it allows learners to learn in a convenient way in terms of time and location. In the present climate where practically all countries including Malaysia are faced with COVID-19 outbreaks, online learning may still be the only option for continuing education. With the limited option in producing high-quality education with minimal contact, online learning is deemed the only realistic alternative (Al-Kumaim et al., 2021; Abdullah et al., 2022). However, it has been discovered that more than 50% of respondents in a study on university students in Malaysia amidst COVID-19 outbreaks indicated that if possible, they would not want to continue with online learning the following semester (Chung et al., 2020b). Therefore, one important aspect that would enable online learning to strive not only during the Covid-19 pandemic but also afterwards is students' acceptance that is reflected in their intention to continue using online learning. Thus, it is undeniable that the willingness of students to continue participating in online learning and their acceptance of this educational technology are critical to the success of online learning (Bozkurt & Sharma, 2020). In the area of technology acceptance, a broadly-used model is the Technology Acceptance Model (TAM)

where this model has been utilised in several studies on online learning (Han & Sa, 2021; Lazim et al., 2021). Two core variables of TAM are perceived usefulness and perceived ease of use.

One aspect that might hinder students' intention to continue online learning is the concern of their ability to fulfil the demand of the curriculum. It is absolutely necessary to have a planned pedagogy that is in line with the curriculum (Mahajan & Patil, 2021). In this regard, the National e-Learning Policy of Malaysia has incorporated agendas throughout the years including the improvement of the quality of teaching and learning (Nazilah et al., 2021). However, the unexpected outbreak of Covid-19 pandemic forces educational institutions to make changes to their pedagogy almost instantly, which brings about several issues. The originally designed curriculum has not been intended to be entirely delivered through online learning. Moreover, it may deem impossible for some topics to be delivered online (Sriyalatha & Kumarasinghe, 2021; Rasit et al., 2021). One important challenge in using online learning is the learner's belief of the benefit to their studies from online learning (Salleh et al., 2020). The originally designed curriculum has not been intended to be entirely or even partially delivered through online learning. Students must adjust themselves from physical learning mode to online learning mode. In addition, they are expected to demonstrate a different form of participation. As such, being worried about the curriculum or more precisely about curriculum fulfilment, students may be taken aback by online learning.

Another aspect that might hinder students' intention to continue using online learning is their online learning readiness. Online learning requires some skills with devices, students who are taking part in online learning need to acquire satisfactory-level skills in working with computers, software, corresponding applications and tools (Suprabha et al., 2017). Therefore, it is important to obtain a look into online learning readiness of the students (Widodo et al., 2020).

As documented in Malaysia Education Development Plan for Higher Education 2015-2025, Malaysia has been focusing on the transition to globalised online education (Ministry of Higher Education Malaysia, 2015). Thus, online learning acceptance and continuance by students is crucial towards this transition. Hence, the aim of this research is to determine factors affecting intention to continue using online learning among university students using TAM framework, with curriculum and online learning readiness as the predictor variables in addition to perceived usefulness and perceived ease of use.

2. Theoretical Background and Hypotheses

Online learning has become a suitable solution to the delivery of education for universities especially during the Covid-19 pandemic. There are several studies on online learning during the pandemic on various forms of online learning platforms including Zoom, Microsoft Teams, Moodle, Google Classroom and virtual reality applications (Bhatt et al., 2020; Al-Maroof et al., 2021).

Technology Acceptance Model (TAM), with its two core components: perceived usefulness and perceived ease of use, has been used in many studies to explain the users' perceived acceptance of technology. For example, these two factors have the important role in facilitating students' on-demand acceptance (Al-Maroof et al., 2021). TAM model is broadly applied in various educational contexts such as e-learning (Alyoussef, 2021), learning management systems (Findik-Coşkunçay et al., 2018), mobile learning (Li et al., 2021) and cloud computing technology (Noh & Amron, 2021). Hence, it is appropriate to apply TAM in online learning contexts (Lazim et al., 2021).

Therefore, TAM model is utilised in this study where in addition to perceived usefulness and perceived ease of use, two new factors have been added to explain the intention to continue using online learning among university students. The factors are curriculum and online learning readiness. These factors are described in the following subsections.

2.1 Intention to Continue using Online Learning

Intention to continue using online learning refers to learner's behavioural tendency and attitude towards online learning (Chen et al., 2021). This intention is important in predicting the actual use of online learning (Sukendroa et al., 2020). Studying students' behavioural intention to use online learning is important towards the success of online learning implementation especially during the Covid-19 pandemic (Muqtadiroh et al., 2020).

In this study, the variable of intention to continue using online learning is defined as the degree of a student's behavioural tendency to use online learning in future.

2.2 Perceived Usefulness

Perceived usefulness (PU) serves as one of two fundamental elements of the TAM model. It may be described as the extent to which learners feel that online learning may enhance not only their studies and classroom performance but also their education in general (Rizun & Strzelecki, 2020). Moreover, a statistically significant connection is anticipated to occur between perceived usefulness and learners' intention to use online learning (Sukendroa et al., 2020). It has been revealed that perceived usefulness significantly influences users' intention to continue utilising e-learning (Brahmasrene & Lee, 2012). Thus, the following hypothesis is formulated for this study:
H1: Perceived usefulness has a positive impact on intention to continue using online learning.

2.3 Perceived Ease of Use

Another fundamental element of the TAM model is perceived ease of use. It has been asserted that simplicity of use has a substantial impact on distance learning during COVID-19 (Rizun & Strzelecki, 2020). Perceived ease of use is defined as the degree to which consumers perceive that using online learning for practical purposes does not require a lot of effort. It has been previously discovered that perceived ease of use affects students' intention to use learning on the internet (Lee et al., 2005). Moreover, a recent study on students' e-learning acceptance in developing countries has also indicated that perceived ease of use positively influences users' behavioural intention to use online learning (Vululleh, 2018). As such, the following hypothesis has been formulated:
H2: Perceived ease of use has a positive impact on intention to continue using online learning.

2.4 Curriculum

During Covid-19 pandemic, classes originally designed to require physical presence were seen to be carried out in the form of e-learning or distance learning. Since these classes of physical presence may not be suitable for online settings, various curriculum-related activities cannot occur as initially intended. Therefore, lecturers are required to take the important initiative to not only change their pedagogy but improve the quality of their online classes from time to time (Abbasi et al., 2020). The sudden occurrence of the COVID-19 pandemic has forced educational institutions all over the world to abruptly change the delivery of some of the curriculum content through online platforms (Sriyalatha & Kumarasinghe, 2021). Students have to move from physical learning mode to online learning mode. In the online mode, students are expected to engage in a different form of participation for collaborative advancement of their studies (Deejring, 2014; Zia, 2020). Hence, it is undeniable that the learning experience of students during online learning is rather different from the usual face-to-face learning (Topal, 2016; Alashwal, 2020). Therefore, with this different teaching and learning mode, students would be very concerned about their ability to fulfil the curriculum.

In this study, the variable of curriculum, which refers to curriculum fulfilment, is defined as the extent of the students' belief of their ability to fulfil the demand of the curriculum through online learning. The following hypothesis has been formulated:

H3: Curriculum has a positive impact on intention to continue using online learning.

2.5 Online Learning Readiness

It is undeniable that the topic on students' readiness for online learning has received a considerable amount of attention over the years. Online learning readiness or preparedness refers to the possession of the necessary abilities and knowledge to use an online learning system (Brahmasrene & Lee, 2012). It has been asserted that the competency of the skills related to using computers and gaining access to the internet should be in alignment with learners' online learning readiness (Suprabha et al., 2017). As a result, the following hypothesis were developed:
H4: Online learning readiness has a positive impact on intention to continue using online learning.

3. Methodology

A cross-sectional survey method has been used in this study where constructs are developed and data collected are then analysed using Partial Least Squares for Structural Equation Modelling (PLS-SEM) technique from which causal relationships are determined. The target population is undergraduate students at Malaysian public universities.

3.1 Development of Constructs

This research uses questionnaire items, where the research questionnaire is divided into two sections. The first section of the questionnaire contains questions regarding the participants' demographic profiles, consisting of gender, age, the primary device they use to access online learning, and university. The second section contains 15 questionnaire items measured using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The questionnaire has been reviewed for content validity by two experts from Universiti Sains Malaysia (USM) and Universiti Utara Malaysia (UUM) where the comment was to improve the English language of the questionnaire. The key constructs in the research framework are perceived usefulness (PU), perceived ease of use (PEOU), curriculum (C), online learning readiness (OLR) and intention to continue using online learning (ICOL). Table 1 shows the items for each construct and the source.

Table 1. Construct development

Construct	Code	Item	Source
Perceived usefulness	PU1	Using online learning improves the effectiveness of my studies.	Rizun & Strzelecki, 2020
	PU2	Using online learning improves my performance in my courses.	
	PU3	Using online learning improves my productivity in my courses.	
Perceived Ease of Use	PEOU1	I found online learning to be easy to use.	Rizun & Strzelecki, 2020
	PEOU2	My connection with online learning is clear and understandable.	
	PEOU3	Finding the required information is easy for me to do when using online learning.	
Curriculum	C1	I understand all the topics that are taught in my online classes.	Siemens &Tittenbergr, 2009 Zia, 2020
	C2	I am able to complete all topics of my courses via online classes.	
	C3	I can complete all assignments and activities that are prescribed in my courses.	

Construct	Code	Item	Source
Online Learning Readiness	OLR1	I am proficient in using the online learning system.	Brahmasrene & Lee, 2012
	OLR2	I have the required skills to use the online learning system.	
	OLR3	I have the ability to become more proficient in using the online learning system.	
Intention to Continue using Online Learning	ICOL1	If inquired, I would probably recommend online learning as an ideal learning method.	Brahmasrene & Lee, 2012
	ICOL2	I would likely use online learning for more advanced degree programs in the future.	
	ICOL3	Overall, I am satisfied with online learning.	

3.2 Sampling and Data Collection

For this research, data has been gathered using convenience sampling strategy. A convenience sampling is a form of non-probability sampling approach in which the sample is drawn from a group of people who are easy to contact or to reach by the researcher. Therefore, based on ease of contact, two universities have been selected: USM and UUM.

Data collection has been done using online survey conducted through GOOGLE form. The links to the form have been shared with the students through the WhatsApp group of lecturers as well as through emails of students yielding the participation of 251 students. In terms of sample size, a minimum sample size in the range of 150-400 has been proposed for the analysis utilising a structural equation (Hair et al., 2006). Table 2 shows the respondents' profile for this study obtained using SPSS 22 software.

Table 2. Respondents' profile

Variable	Description	No. of Respondents	%
Gender	Female	182	72.5
	Male	69	27.5
Age	18-20	128	51.0
	21-24	46	18.3
	Above 24	77	30.7
What primary device do you use to access the Online Learning	Desktop	7	2.8
	Laptop	201	80.1
	Smartphone	38	15.1
	Tablet	5	2.0
University	USM	104	41.4
	UUM	147	58.6

3.3 Construct Reliability

Table 3 shows that the Cronbach alpha values for each of the constructs used in this study are greater than 0.8. Cronbach's alpha scores between 0.8 and 0.9 are regarded as very good, while values more than 0.9 are regarded as excellent (Nawi et al., 2020). As a result, the internal consistency of the constructs used in this work has been confirmed.

Table 3. Constructs' Reliability

Latent Construct	No. of items	Cronbach's Alpha
PU	3	0.900
PEOU	3	0.862
C	3	0.882
OLR	3	0.925
ICOL	3	0.936

4. Results

The gathered quantitative data has been analyzed using Smart Partial Least Square M3 (version 3.2.7). PLS-SEM is a technique in which causal relationships are determined using two stages. In the first stage, the measurement model has been initially examined in order to evaluate the instrument's reliability and validity where the instrument consists of five constructs. After that, the aforementioned hypotheses are tested with the utilisation of a structural model.

4.1 Measurement Model

This indicator loadings of the instrument, which initially contained 15 items, were produced through the results of the PLS-SEM. It can be observed in Table 4 that 14 items exceeded the recommended loading value of 0.708 as recommended by Hair et al. (2019). However, in this regard, one item (C3) has been removed from the PLS-SEM algorithm since its loading value is below 0.708. Hence, only the remaining 14 items would enter the next stage of the PLS-SEM analysis.

In examining the reliability of the constructs with respect to the remaining items, the construct reliability (CR) value for each of the constructs has been found to be above 0.70, meeting the rule of thumb presented by Hair et al. (2019). For example, the construct ICOL has the highest CR value of 0.959, as can be observed in Table 4.

Meanwhile, convergent validity represents a statistical relation which is related to construct validity. It can be gathered from convergent validity that a great relation should exist between assessments with similar or identical constructs. On this matter, the scores of average variance extracted (AVE) need to be observed as well. The AVE scores are required to be higher or equal to 0.500, thus explaining 50 percent or a greater portion of the variance (Hair et al., 2019). All constructs in this study possessed AVE scores above 0.500 as can be seen in Table 4.

Table 4. Measurement model (n=251)

Code	Item	Loading	AVE	CR
PU	PU1	0.854		
	PU2	0.945	0.835	0.938
	PU3	0.939		
PEOU	PEOU1	0.892		
	PEOU2	0.878	0.784	0.916
	PEOU3	0.887		
C	C1	0.948	0.895	0.944
	C2	0.944		
OLR	OLR1	0.934		
	OLR2	0.922	0.868	0.952
	OLR3	0.940		
ICOL	ICOL1	0.945		
	ICOL2	0.948	0.887	0.959
	ICOL3	0.931		

To verify the measurement model, the discriminant validity of the Heterotrait-Monotrait (HTMT) ratio is used. The value of 0.90 has been applied in prior studies for the construct threshold of the HTMT ratio (Hair et al., 2019). With respect to this threshold value, the results given in Table 5 indicate the validation of the measurement model.

Table 5. Discriminant validity of HTMT

Code	C	ICOL	OLR	PEOU	PU
C					
ICOL	0.803				
OLR	0.871	0.687			
PEOU	0.896	0.861	0.846		
PU	0.811	0.852	0.690	0.846	

4.2 Structural Model

To test the significance of estimated path coefficients, PLS-SEM employs a non-parametric bootstrap approach since PLS-SEM does not presume that the data is regularly distributed. Therefore, bootstrapping is a critical step in the development of the structural model where bootstrapping of 5,000 sub-samples has been recommended (Hair et al., 2019). The results of the path analysis are tabulated in Table 6 and illustrated in Figure 1, indicating that hypotheses H1, H2 and H3 are supported, whereas H4 is not (ß=0.026, t-value=0.424, p=0.336 where t-value and p-value should be $p < 0.05$, $t > 1.645$, or $p < 0.0$, $t > 2.27$, or $p < 0.001$, $t > 3.92$). The beta-value is also important for determining not only the direction but also the strength of the relationship between two variables. For example, the beta value of 0.406 for PU→ICOL indicates a positive relationship between the two variables.

Table 6. Significance of direct-effect path coefficients (n=251)

Hypothesis	Path	Beta value	t-value	p-value	Result
H1	PU→ICOL	0.406	5.595***	0.000	Supported
H2	PEOU→ICOL	0.321	3.873***	0.000	Supported
H3	C→ICOL	0.168	2.154*	0.016	Supported
H4	OLR→ICOL	0.026	0.424	0.336	Not supported

Note: *p<0.05, t>1.645, **p<0.01, t>2.327, ***p<0.001, t>3.092 (one tailed)

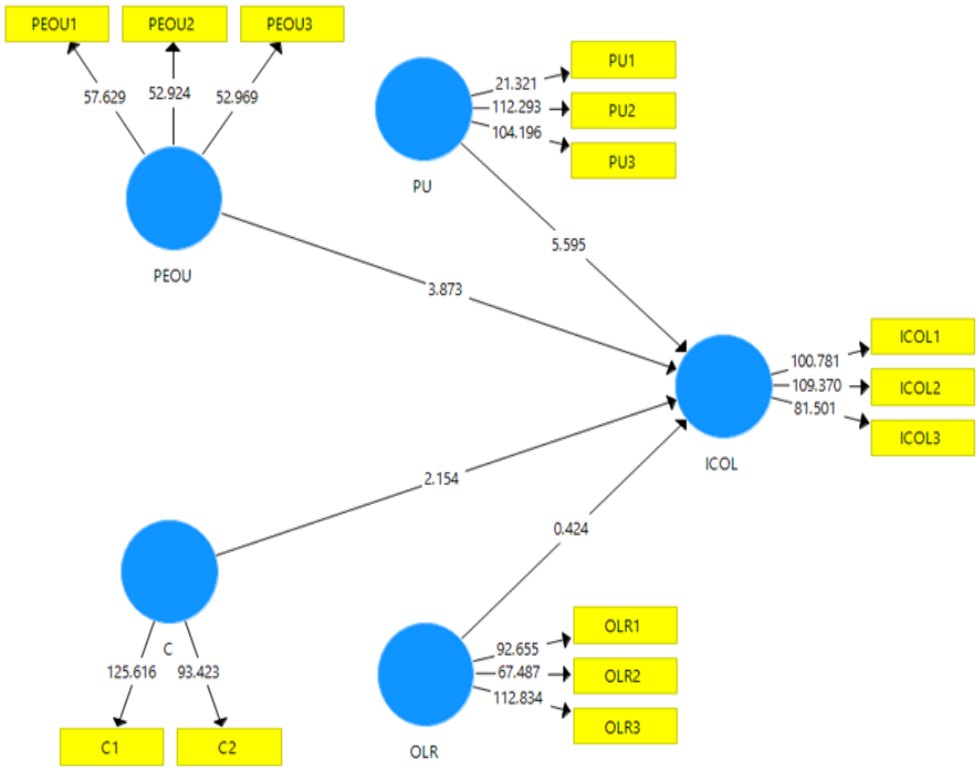

Fig. 1 Results of the Structural Model

4.3 Coefficient of Determination (R^2)

The coefficient of determination (R^2) serves as a measure of the regression analysis and refers to the variance proportion of endogenous variable with the potential to be predicted by the exogenous variables. Furthermore, the predictive accuracy of a proposed model may be explained using this coefficient. This coefficient value is defined as the squared correlation between the respective constructs, with the value ranging from 0 to 1. In addition, the R^2 values of 0.75, 0.50 and 0.25 are deemed as substantial, moderate and weak, respectively (Hair et al., 2019). The value of ICOL in this study is 0.707, meaning that the obtained R^2 is at a moderate level.

4.4 Predictive Relevance (Q^2)

Commonly recognized as Stone-Geisser's Q^2, the predictive sample reuse technique can be employed as a criterion with respect to predictive relevance aside from inspecting the magnitude of R^2. This measure has been applied to examine the capability of the research model to make predictions (Henseler et al., 2009). On the foundation of the blindfolding procedure, Q^2 examines a model's predictive validity using PLS. In addition, values of Q^2 surpassing zero signify predictive relevance in the exogenous constructs for the endogenous construct (Hair et al., 2019). In this study, the obtained value of Q^2 for intention to continue using online learning (Q^2=0.585>0) indicates outstanding predictive relevance of the research model.

5. Discussion

This paper aims to model the intention to continue using online learning among students in universities in Malaysia based on TAM. The two core factors of TAM and two additional factors: curriculum and online learning readiness, have been used as predictor variables. Four factors are initially chosen and their influences towards the intention to continue using online learning are evaluated. Using PLS-SEM analysis, path coefficients are examined with the objective of revealing the effects of the factors.

Findings indicate positive impacts of both core factors of TAM on the intention to continue using online learning among Malaysian university students. Moreover, in this study, perceived usefulness has been found to be the factor with the strongest and positive impact, indicating that the more the Malaysian students perceive online learning to be useful, the more they would intend to continue using online learning. Meanwhile, perceived ease of use is the next strongest contributing factor. This finding signifies that Malaysian students would intend to continue using online learning given that they believe using online learning can take place with minimum effort. In other words, their motivation regarding accepting and utilising online learning stems from their evaluation of important aspects connected to the ease of use of online learning including the corresponding interfaces and processes. These significant findings for both core factors of TAM resonate previous findings in a study of students in the United Arab Emirates (Al-Maroof et al., 2021). Perceived usefulness has also been found to be significant in a study on students in Indonesia (Sukendroa et al., 2020). With respect to perceived ease of use, a study on students in developing countries has also obtained significant results for this factor (Vululleh, 2018).

Curriculum is another factor that positively influences Malaysian students' intention to continue using online learning. Similarly, this factor has also been found to be influential in a study on students in Sri Lanka (Sriyalatha & Kumarasinghe, 2021). In today's increasingly dynamic world especially during the Covid-19 pandemic, having access to study materials online is an absolute necessity for every course. Indeed, numerous libraries provide students with free books and many publishers provide lecturers with the free online material. Moreover, no major difference has been observed between online and paper-based study materials with respect to students' learning efficiency and transfer of knowledge while nevertheless, in the majority of cases, learners prefer paper-based study materials over ones provided online, which is compensated by the lower fees charged when purchasing materials over the Internet (Deejring, 2014).

Nevertheless, for online learning readiness, there is no significant influence of this factor towards the intention to continue using online learning among the university students in Malaysia. The demographic data indicate that 70% of the respondents are of the age below 24, placing them under the generation labelled as "digital natives". This generation refers to young people who have been living their lives with technological devices (Ministry of Higher Education Malaysia, 2015). Moreover, a study on online learning readiness at a university in Malaysia indicated that students have confidence in their internet skills for online learning (Chung et al., 2020a). Therefore, this insignificant finding of online learning readiness towards the intention to continue online learning is due to the students' familiarity and confidence with the internet.

6. Conclusion

The sudden change in the delivery of the university curriculum through online learning, which was caused by the Covid-19 outbreak, had the tendency to raise student's concern of their own ability to fulfil the demand of the curriculum. Using the framework of TAM and PLS-SEM analysis, results indicated that curriculum has a positive impact on students' intention to continue online learning while other significant factors are perceived ease of use and perceived usefulness.

This research makes a contribution to knowledge with regard to factors related to the necessity of online learning as a result of the COVID-19 pandemic. When the extent of the students' belief of each of the three significant factors increases then the extent of their intention to continue using online learning would also increase. Based on the findings, it is recommended that those with the aim of encouraging online learning among students should focus on steps to convince students of the

usefulness of online learning and of how online learning is easy to use. With respect to curriculum, it is recommended that universities in Malaysia involve the academic staff to make the relevant steps in developing online teaching contents and online learning methods geared towards assisting students in fulfilling the demand of the curriculum through online learning.

7. References

Abbasi, S., Ayoob, T., Malik, A., & Memon, S. I. (2020). Perceptions of students regarding E-learning during Covid-19 at a private medical college. *Pakistan journal of medical sciences, 36*(COVID19-S4), 1-5. https://doi: 10.12669/pjms.36.COVID19-S4.2766

Abdullah, M. H. T., Roslim, N., & Salleh, M. I. M. (2022). Open and Distance Learning during the COVID-19 Pandemic: University Students' Learning Experiences and Academic Achievements. *Asian Journal of University Education, 18*(1). https://doi.org/10.24191/ajue.v18i1.17177.

Alashwal, M. (2020). Curriculum Development Based on Online and Face-to-Face Learning in a Saudi Arabian University. *Journal of Curriculum and Teaching, 9*(3), 141-184. https://doi.org/10.5430/jct.v9n3p141

Al-Kumaim, N. H., Alhazmi, A. K., Mohammed, F., Gazem, N. A., Shabbir, M. S., & Fazea, Y. (2021). Exploring the Impact of the COVID-19 Pandemic on University Students' Learning Life: An Integrated Conceptual Motivational Model for Sustainable and Healthy Online Learning. *Sustainability, 13*, 1-20. https://doi.org/10.3390/su13052546.

Al-Maroof, R. S., Alhumaid, K., Akour, I., & Salloum, S. (2021). Factors That Affect E-Learning Platforms after the Spread of COVID-19: Post Acceptance Study. *Data, 6* (5), 1-23. https://doi.org/10.3390/data6050049

Alyoussef, I. Y. (2021). E-Learning Acceptance: The Role of Task–Technology Fit as Sustainability in Higher Education. *Sustainability, 13*, 1-15. https://doi.org/10.3390/su13116450

Bhatt, V., Chakraborty, S., & Chakravorty, T. (2020). Impact of Information Sharing on Adoption and User Satisfaction among the Wearable Device Users. *International Journal of Control and Automation, 13*(4), 277–289.

Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to Corona Virus pandemic. *Asian Journal of Distance Education, 15* (1), i-vi.

Brahmasrene, T., & Lee, J. W. (2012). Determinants of Intent to Continue Using Online Learning: A Tale of Two Universities. *Interdisciplinary Journal of Information, Knowledge, and Management, 7*, 1-20.

Chen, M., Wang, X., Wang, J., C., Zuo, J. Tian & Y. Cui (2021). Factors Affecting College Students' Continuous Intention to Use Online Course Platform. *SN Computer Science, 2* (114), 1-11. https://doi.org/10.1007/s42979-021-00498-8

Chung, E., Noor, N. M., & Mathew, V. N. (2020a). Are you ready? An assessment of online learning readiness among university students. *International Journal of Academic Research in Progressive Education and Development, 9*(1), 301-317.

Chung, E., Subramaniam, G., & Dass, L. C. (2020b). Online learning readiness among university students in Malaysia amidst COVID-19. *Asian Journal of University Education, 16*(2), 45-58. https://doi.org/10.24191/ajue.v16i2.10294

Deejring, K. (2014). The design of web-based learning model using collaborative learning techniques and a scaffolding system to enhance learners' competency in higher education. *Procedia – Social and Behavioral Sciences, 116*, 436-441. https://doi.org/10.1016/j.sbspro.2014.01.236

Findik-Coşkunçay, D., Alkiş, N., & Özkan-Yildirim, S. (2018). A Structural Model for Students' Adoption of Learning Management Systems: An Empirical Investigation in the Higher Education Context. *Educational Technology & Society, 21*(2), 13-27.

Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2006). *Multivariate Data Analysis* (6th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2-24. https://doi.org/10.1108/EBR-11-2018-0203

Han, J. H., & Sa, H. J. (2021). Acceptance of and satisfaction with online educational classes through the technology acceptance model (TAM): the COVID-19 situation in Korea. *Asia Pacific Education Review*, 1-13.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing, 20*, 277–319. https://doi.org/10.1108/EBR-11-2018-0203

Lee, M. K. O., Cheung, C. M. K., & Chen, Z. (2005). Acceptance of internet- based learning medium: The role of extrinsic and intrinsic motivation. *Information & Management, 42*(8), 1095–1104. https://doi.org/10.1016/j.im.2003.10.007

Li, Y., Nishimura, N., Yagami, H., & Park, H. S. (2021). An Empirical Study on Online Learners' Continuance Intentions in China. *Sustainability, 13* (2), 1-18. https://doi.org/10.3390/su13020889

Lazim, C. S., Ismail, N. D., & Tazilah, M. D. (2021). Application of Technology Acceptance Model (TAM) Towards Online Learning During COVID-19 Pandemic: Accounting Students Perspective. *International Journal of Business, Economics and Law, 24*(1), 13-10.

Mahajan, P., & Patil, V. (2021). Making it normal for 'new' enrollments: effect of institutional and pandemic influence on selecting engineering institutions under the COVID-19 pandemic situation. *Heliyon, 7,* 1-12. https://doi.org/10.1016/j.heliyon.2021.e08217

Ministry of Higher Education Malaysia. (2015). *Ministry Education Blueprint (2015-2025).* In Putrajaya: Ministry of Higher Education Malaysia.

Muqtadiroh, F. A., Herdiyanti, A., & Puspitasari, N. (2020). The e-learning quality model to examine students' behavioral intention to use online learning platform in a higher education institution. *Khazanah Informatika: Jurnal Ilmu Komputer dan Informatika, 6*(2), 176-183.

Nawi, M. A. F., Tambi, M. A., Samat, F. M., & Mustapha, W. M. W. (2020). A review on the internal consistency of a scale: the empirical example of the influence of human capital investment on Malcom Baldridge quality principles in tvet institutions. *Asian People Journal, 3*(1), 19-29. https://doi.org/10.37231/apj.2020.3.1.121

Nazilah, A., Ibrahim, C. W. I. R. C. W., Rohaizad, N. A. A., Norillah, A., Ibrahim, R. Z. A. R., & Dagang, M. (2021). Counselling Students' Perception of Online Learning during COVID-19 in Malaysia. *The Electronic Journal of e-Learning, 19*(4), 282-295. https://doi.org/10.34190/ejel.19.4.2445

Noh, N. H. M., & Amron, M. T. (2021). Exploring Cloud Computing Readiness and Acceptance in Higher Education Institution: A PLS-SEM Approach. *Asian Journal of University Education, 17*(4), 367-376. https://doi.org/10.24191/ajue.v17i4.16193

Rasit, A. H., Ujir, H., Jen, C. C., Sapawi, R., & Hipiny, I. (2021). Wide Survey on Online Teaching and Learning during Movement Control Order in Malaysia due to Covid-19 Pandemic. *International Journal of Academic Research in Business and Social Sciences, 11*(14), 285–300. http://dx.doi.org/10.6007/IJARBSS/v11-i14/8574

Rizun, M., & Strzelecki, A. (2020). Students' Acceptance of the COVID-19 Impact on Shifting Higher Education to Distance Learning in Poland. *International journal of environmental research and public health, 17*(18), 1-19. https://doi.org/10.3390/ijerph17186468

Salleh, F. I. M., Ghazali, M., Ismail, W. N. H. W., Alias, M., & Rahim, N. S. A. (2020). The Impacts of COVID-19 through Online Learning Usage for Tertiary Education in Malaysia. *Journal of Critical Reviews, 7*(8), 147-149.

Siemens,G., & Tittenberger, P. (2009), *Handbook of Emerging Technologies for Learning*, University of Manitoba, Image Rochester NY, p. 65, available at: http://umanitoba.ca/learning_ technologies/cetl/HETL.pdf.

Sriyalatha, M. A. K., & Kumarasinghe, P. J. (2021). Factors Influencing Online Education during COVID-19 Pandemic: Sri Lankan Students' Perspective. *International Journal of Engineering and Management Research, 11*(4), 203-213. https://doi.org/10.31033/ijemr.11.4.25

Sukendroa, S., Habibi, A., Khaeruddin, K., Indrayana, B., Syahruddin, S., Makadada, F. A., & Hakim, H. (2020). Using an extended Technology Acceptance Model to understand students' use of e-learning during Covid-19: Indonesian sport science education context. *Heliyon, 6* (11), 1-9. https://doi.org/10.1016/j.heliyon.2020.e05410

Suprabha, B. S., Shenoy, R., Rao, A., & Naik, D. G. (2017). Readiness and utilization of computer-assisted learning among dental students and faculty. *Dental Hypotheses, 8*(4), 87–93. https://doi: 10.4103/denthyp.denthyp_18_17.

Topal, A. D. (2016). Examination of University Students' Level of Satisfaction and Readiness for E-Courses and the Relationship between Them. *European Journal of Contemporary Education, 15*(1), 7-23. https://doi.org/10.13187/ejced.2016.15.

Vululleh, P. (2018). Determinants of students' e-learning acceptance in developing countries: An approach based on Structural Equation Modeling (SEM). *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 14*(1), 141-151.

Widodo, S. A.,Wibowo, Y. E., & Wagiran, W. (2020). Online learning readiness during the Covid-19 pandemic. *Journal of Physics: Conference Series, 1700*, 1-4. https://doi.org/10.1088/1742-6596/1700/1/012033

Zia, A. (2020). Exploring factors influencing online classes due to social distancing in COVID-19 pandemic: a business students' perspective. *International Journal of Information and Learning Technology, 37*(4), 197-211. https://doi.org/10.1108/IJILT-05-2020-0089