

IDENTIFICATION FACTORS INFLUENCING E-LEARNING SATISFACTION DURING COVID-19 PANDEMIC PERIOD AMONG STUDENTS AT A MALAYSIA PRIVATE INSTITUTION

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Received: 28 July 2021

Accepted: 4 August 2021

Online first: 27 August 2021

ABSTRACT

The rapid occurrences of Corona Virus Disease (Covid-19) have posed various challenges to our society, including the quality of education system in Malaysia. The current study aims to first measure the impact of demographic variables (gender, age and education level) and non-demographic variables (perceived usefulness, perceived ease of use and technological factor) on e-learning satisfaction among students from a higher education institution in Malaysia, and to construct a student satisfaction prediction model subsequently. A structured questionnaire survey was administered to a total of 344 respondents and the statistical analysis of Chi-Square test and Multiple Regressions was performed. The result of the study reveals that satisfaction of students on e-learning experience during the pandemic is significantly correlated to gender. The study further shows that three dominant variables, namely perceived usefulness, perceived ease of use and technological factor are significant factors that influence the satisfaction level of students' learning in the e-learning environment. The findings of the study will be beneficial to policy makers to identify the level of student satisfaction on e-learning education during the COVID-19 pandemic and may provide evidence-based data to improve the learning performance of students.



Keywords: e-learning satisfaction, COVID-19, Malaysia

INTRODUCTION

The COVID-19 pandemic has brought a lot of changes in human life including our whole learning process especially in higher learning institutions. The proliferation of information and communication technology such as the internet, online meeting software and social media allows educators and students to manage daily teaching and learning activities continuously via virtual classroom. Online learning, which is also known as e-learning (Khogali, Davies, Donnan, Gray, Harden & McDonald, 2011; Wheeler, 2012), provides affordances for the learning process to take place synchronously and asynchronously across time and space, as long as both learners and education providers have stable internet connection (Al-Samarraie, Selim, & Zaqout, 2016).

The World Health Organisation (WHO) officially declared the outbreak as a pandemic on 11 March 2020, and the government of Malaysia had started to impose the Movement Control Order (MCO) on 18 March 2020 subsequently. Traditional educational activities which involve face to face interactions were suspended at all levels to control the spread of COVID-19. The only choice to make sure the continuity in acquiring knowledge and skills is through the adoption of e-learning to replace traditional teaching and learning methods. With the integration of communication and information technology, the e-learning process should become more interesting.

In Malaysia, education is one of the most important contributing factors towards nation building, development and progress. Amid the global pandemic, there is a pressing need to investigate student experience in online learning. The effectiveness of online education can be gauged by analysing the strength of satisfaction by its most crucial stakeholders – the students. Thus, this study intends to identify the demographic characteristics and other essential factors that may influence the satisfaction level of students on e-learning in Malaysia during the pandemic period. It is hoped that the study may provide evidence-based data which would be helpful in conducting online education with more efficiency and to enhance the learning satisfaction of students.

LITERATURE REVIEW

Gender

The current study adopts Davis's (1989) Technology Acceptance Model (TAM) as the theoretical framework, and recognises that gender is an important component to understand user perceptions of usefulness and ease of use as determining factors for technology adoption. This proposition is based on the suggestions made by previous studies that gender plays an important role in predicting usage behaviour (He & Freeman, 2010). In another study examining the relationship between gender and e-learning satisfaction, Gomez, Guardiola, Rodriguez and Alonso (2011) found that there was significant different effect experienced by both male and female students with regards to their e-subject satisfaction. Meanwhile, findings by research from the same field of other study concluded that female students were reportedly more satisfied than male students about their e-learning experience (Manuel, Maria & Juan, 2010; Al-Azawei, Parslow & Lundquist, 2017; Cai, Fan & Du, 2017; Shahzad, Hassan & Aremu, 2020). Beqiri (2010) and Boyte-Eckis (2018) stated that gender is a significant variable affecting students' satisfaction on online education. The study reported a higher satisfaction level among the male students as they had a higher mean score of satisfaction. However, there were other findings where no significant relationship between gender and e-learning satisfaction was observed among the students (Cole, Shelly & Swartz, 2014; Chen, Peng, Yin, Rong & Cong, 2020).

H1: There is a significant relationship between gender of student and e-learning satisfaction during the COVID-19 MCO period.

Age Group

Prior studies suggested that age is a crucial personal factor that has direct and moderating effects on the adoption and acceptance of technology and behavioural intention (Venkatesh, Morris & Davis, 2003; Chung, Park, Wong, Fulk & Mclaughlin, 2010). Age is the key in understanding the reasons why individuals from different age groups are different when it comes to making choices concerning technology adoption especially in

education. For example, older folks are normally less experienced in using new technologies for learning. Thus, it is vital for them to be exposed to the current technologies.

Jennings and Onwuegbuzie (2001) conducted a study to investigate how age is significantly connected to the four dimensions of computer attitude: anxiety, confidence, satisfaction, liking, and usefulness. They discovered that the level of computer confidence can be influenced by age, and the level of satisfaction in using computers was reported to be lower among younger students. This is in contrast with another group of older students, which reported the highest level for computer liking and perceived usefulness of using computers in their study.

Lee, Yeung and Ip (2016) analysed the relationships between three key items of Self-Directed Learning (SDL), such as self-management, desire for learning, and self-control, computer technology use and personal factors such as age to investigate student readiness for the use of computer for SDL in English language learning in a university. Based on the research, they discovered that age differences did not account significantly with satisfaction for the use of computers for SDL, even though the older students scored higher for anxiety and learning.

H2: There is a significant relationship between age of student and e-learning satisfaction during the COVID-19 MCO period.

Level of Education

For the purpose of this research, the level of education only considers educational stages in higher institution of learning which include certificate, foundation, diploma and undergraduate (bachelor's degree). Previously, education level was found to be an external variable that affects the Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) on e-learning (Agarwal & Prasad, 1999; Burton-Jones & Hubona, 2006). It was employed as a moderator that influences the relationships between the proposed factors (Sun & Zhang, 2006; Abu-Shanab, 2011; Tarhini, Hone & Liu, 2014). Additionally, past studies have highlighted the existence of a positive relationship between the level of education and individuals' use of technologies in education to achieve self-satisfaction (Lymperopoulos & Chaniotakis, 2005; Burton-Jones & Hubona, 2006; Abu-Shanab, 2011).

H3: There is a significant relationship between education level of student and e-learning satisfaction during the COVID-19 MCO period.

Perceived Ease of Use

According to Davis (1989), the original definition of perceived ease of use is 'the degree to which a person believes that using a technology will be free from effort'. This means if students perceive that the online learning system can help improve their performance, they are more likely to adopt online learning in their learning process (Yee, Luan, Ayub & Mahmud, 2009).

There is an abundance of studies on a variety of issues related to the perceived ease of use of technology in e-learning. In fact, prior studies have also determined the positive relationship between perceived ease of use and favourable attitude or satisfaction (Chang & Wang, 2008; Stoel & Lee, 2003). Furthermore, research on the positive relationship between perceived ease of use and intentions in the context of e-learning has also been done (Arbaugh & Duray, 2002; Pituch & Lee, 2006). Individuals have favourable feeling of satisfaction with online experiences when it is perceived to be useful and easy to use (Devaraj, Fan, & Kohli, 2002; Pavlou, 2003).

In sum, perceived ease of use can be understood as user perception of the amount of effort required to utilise technology or computer system or the extent to which a user believes that using a particular technology will be effortless (Alrafi, 2009). Prior studies have shown that perceived ease of use has a significant impact on consumer satisfaction (Lin, 2008).

H4: Perceived ease of use significantly influences students' e-learning satisfaction during the COVID-19 MCO period.

Perceived Usefulness

According to Davis (1989), the original definition of perceived usefulness is 'the extent to which a person believes that using a particular technology will enhance her/his job performance.' Specifically, consumers are more likely to develop satisfaction and have favourable intentions toward online experiences if they perceive the experience to be useful to them (Bhattacharjee, 2001).

There have been many studies conducted on perceived usefulness and its relationship with user satisfaction. For instance, Arbaugh and Duray (2002) and Chiu, Chang, Cheng and Fang (2009) documented a significant positive impact of perceived usefulness on satisfaction. Also, a study which focused on parents' attitudes toward online parenting resources also showed that positive consideration about the usefulness of online parenting resources was related to willingness to adopt online technology (Chang & Chen, 2020).

Apparently, perceived usefulness of technology involves users' judgement on the extent to which whether using an information system can improve their job performance. Also, prior studies have verified that perceived usefulness has a significant impact on satisfaction of consumers (Lin, 2008).

H5: Perceived usefulness significantly influences students' e-learning satisfaction during the COVID-19 MCO period.

Technological Factor

To reduce the spread of COVID-19 in the country, the government of Malaysia has decided to close down all educational institutions as a temporary measure. Teachers are being mobilised to keep the teaching and learning process going during this difficult period. Wisanti, Ambawati, Putri, Rahayu and Khaleyla (2020) mentioned that online class involves all kinds of educational situations where information and communication equipment and technology are deployed significantly. The main factors that support online learning are internet connection and computer or cellular media. The transition from traditional face to face teaching and learning to virtual classroom is not without its challenges as both educators and students are required to adjust quickly for the new norm in teaching and learning. Educators are prompted to reconsider factors to promote effective learning, such as active learning, motivation, and making use of feedback on the efficiency of technology (Wisanti *et al.*, 2020) when conducting online learning. These are important factors to enhance students' self-confidence and satisfaction throughout the e-learning process.

Many research studies have addressed factors influencing the satisfaction on e-learning. The COVID-19 pandemic has obliged most

education systems in the global world to shift to e-learning which has become a primary teaching and learning approach during the lock-down periods. Consequently, this gives rise to the increase of studies from both practitioners and academic researchers to measure the effectiveness of e-learning and the application of new tools or methods in online platforms for e-learning. A number of studies found that the factors contributing to the acceptance of e-learning are the infrastructure of technology and technical support in e-learning system. Furthermore, to increase e-learning acceptance and satisfaction level, the technology and the e-learning system must be well maintained and up to date (Folorunso, Ogunseye & Sharma, 2006; Poon, Low & Yong, 2004; Selim, 2005). Rafaeli and Sudweeks (1997) argued that if the information and communication technology used was reliable, students would be able to study better and more satisfied with their e-learning environment, and would have higher e-learning acceptance eventually.

Studies showed that facilitation of technical matters, attitude of student and instructor, computer efficacy, teacher response during e-learning process, and interface of e-learning environment were the core factors that influence students' satisfaction towards e-learning. According to Ahmed (2010), the acceptance and satisfaction of e-learning could be determined through three variables, i.e., information technology infrastructure, instructor characteristics and organisational and technical support. Furthermore, there have been studies evaluating the adoption of advanced technologies for e-learning, such as the use of smartphones and tablets, which is also known as mobile learning (Chanchary & Islam, 2011; Nassuora, 2013; Seliaman & Al-Turki, 2012). These studies have proven that technology is positively related to the acceptance and adoption level of e-learning in the educational context. In sum, technological factor is a critical determinant of students' behavioural intention to adopt e-learning.

H6: Technological factor significantly influences students' E-learning satisfaction during the COVID-19 MCO period .

DATA AND METHODOLOGY

Conceptual Framework

The rationale for choosing the sampling frame for this study was to analyse the factors that affected students' satisfaction on e-learning during the COVID-19 pandemic in Malaysia. The study adapted Davis's (1989) Technology Adoption Model (TAM) to measure the variables using a Likert scale of 1 – 5 with end points of 'strongly disagree' and 'strongly agree'. This instrument is also widely used by researchers for similar study in other contexts (DeLone & McLean, 2003; Pilli, Fanaeian & Al-Momani, 2014; Mohammadi, 2015).

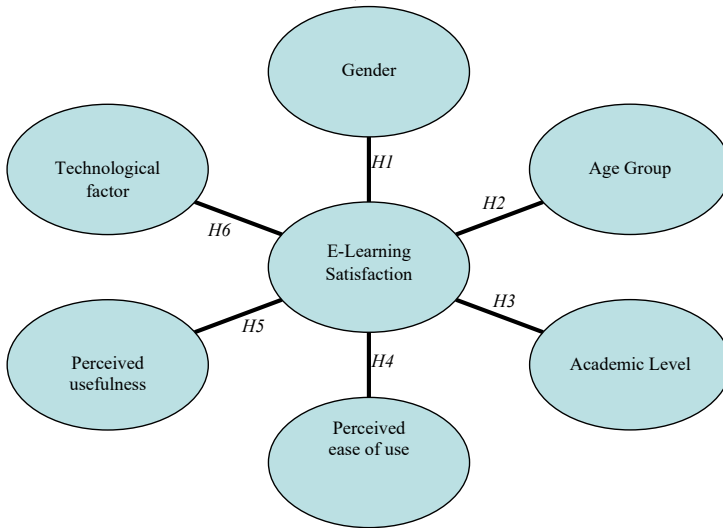


Figure 1: Path Model for Current e-Learning Satisfaction

Research Method

In this study, the target samples were students from a private higher education institution in Malaysia. The study employed convenience sampling and a cross-sectional survey questionnaire was administered from September 2020 to January 2021 to collect the required data. The questionnaire covered different aspects: socio-demographic characteristics, perceived

usefulness, perceived ease of use, technological factor and satisfaction of the respondents towards e-learning during the MCO period. The dependent variable in this study referred to the satisfaction of the university students, where a low scoring of satisfaction of respondents indicates the tendency of being averse to e-learning, while a high scoring of satisfaction suggests the tendency of being e-learning taker. On the other hand, the independent variables in this study were gender (male and female), age (ratio), level of study, perceived usefulness, perceived ease of use and technological factor. All variables were measured by using a Likert scale of 1 – 5 from ‘strongly disagree’ to ‘strongly agree’. A total of 344 university students responded to the questionnaire survey. The descriptive analysis of the respondents’ demographic profile is shown in Table 1.

Table 1: Demographic Characteristic of Respondents (n=344)

Category	Total (%)
Gender	
Male	49.1
Female	50.9
Academic Level	
Pre-U/ Foundation	8.5
Diploma	73.5
Bachelor	18.0
Programme Enrolled (Major)	
Business Studies	29.9
Accounting and Finance	7.9
Information Computing Technology (ICT)	33.7
Chinese Language & Literature	4.9
Education	2.9
Guidance & Counselling psychology	1.5
Media Studies	4.4
Drama & Visual	1.7
Art & Design	13.1
Age Group	
15-19	60.8
20-24	37.5
25 and above	1.7

Table 1 displays the respondents' socio demographic profile. Out of the 344 respondents, 169 were males and 175 were females. Most of the respondents were diploma students (73.5%), and 60.8% of them were below 20 years old. Close to one third of the respondents were students majoring in Information Computing Technology (33.7%) and business studies (29.9%).

RESULTS AND DISCUSSION

The findings of the study showed that there are three core demographic and three non-demographic factors that are related to e-learning satisfaction among the target respondents. The demographic factors that were included in this study are gender, age and level of education registered by students, while the non-demographic factors are perceived ease of use (PEU), perceived usefulness (PU) and technological factor (TF). The dependent variable is students' satisfaction with e-learning. In this study, the questionnaires were distributed to students whom had taken the subjects during the semester of lockdown periods. The questionnaire was tested by reliability analysis which measures the item correlation and internal consistency. Questions 1 to Question 5 focused on student perception or perceived ease of use for e-learning. Question 2 was removed from the scale, yielding the Cronbach's Alpha value for this factor to 0.78.

Questions 6 to Question 13 focused on perceived usefulness but question 11 was eliminated from the scale eventually. The overall Cronbach's Alpha value for this factor was 0.83. The technological factor had four questions to measure the construct and its overall Cronbach's Alpha value was 0.738. Furthermore, there were six questions (Question 19 to Question 24) constructed to measure the dependent variable – e-learning satisfaction. Since there was no question being removed from this part, the overall Cronbach's Alpha value was 0.822. All the Cronbach's Alpha values of the variables were greater than 0.7, showing that the internal reliability of questionnaire of this research was high.

Table 2: Reliability Analysis

Construct	Cronbach's Alpha
Perceived ease of use	0.781
Perceived usefulness	0.830
Technological factor	0.738
E-learning satisfaction	0.822

Validity Test

The validity test was performed to ensure that the research questionnaire has high validity of content. Generally, when Kaiser–Meyer–Olkin's (KMO) value is greater than 0.5, and the significance level of the Bartlett's test meets the significance of confidence level of the test, it is considered that the questionnaire meets the sampling adequacy. The results of the validity test are presented in Table 3 below. It can be seen that the test values of the KMO and Bartlett's test of the indicators in the questionnaire met the requirements.

Table 3: KMO and Bartlett's Test-Meyer-Olkin Measure

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.909
Bartlett's Test of Sphericity	Approx. Chi-Square	6938.602
	df	780
	Sig	.000

The Results of Chi-Square Test

Results from further analysis by using Chi-Square test showed that there is significant relationship ($df=2$, $P = .027$ and significant at 5% level) between the dependent variable (satisfaction level on e-learning) and the gender of students. The result is similar to another study reported by Manuel *et al.* (2010). However, the test indicated that students' age and education level did not have any significant relationship with the level of e-learning satisfaction they had experienced. The result is consistent with the research findings reported by Kuo and Belland (2016) and Morin *et al.* (2019). Results from this study revealed that age ($df=4$, $P = .22$) and education level ($df=4$,

P = .13) can be considered as non-effective factors in predicting variance in e-learning satisfaction level. It is because the significant p-value for both demographic factors failed to meet the selection criteria with a non-significant value greater than .05.

The Results of Multiple Regression Analysis

In Table 4, three variables, namely perceived ease of use, perceived usefulness and technological factor were included into the regression equation:

$$y = 0.397 + 0.126x_1 + 0.442x_2 + 0.318x_3 \tag{1}$$

where y is e-learning satisfaction and x_1, x_2, x_3 are factors of perceived ease of use, perceived usefulness and technological factor respectively. Regression analysis showed that the model was significant ($F = 153.9507$, p -value < 0.000) and there was a positive relationship ($r = 0.759$) between e-learning satisfaction with the other three different important variables. The regression equation indicated that 57.6% of variability in students' satisfaction is strongly affected by the variation of the three non-demographic factors in the regression equation.

Table 4: The Significant of Coefficients

Variable	Unstandardised coefficients		Standardised coefficients	t	sig. p-value
	B	Std error	Beta		
Constant	0.397	0.165		2.414	0.016
Perceived ease of use	0.126	0.040	0.142	3.170	0.002***
Perceived Usefulness	0.442	0.050	0.424	8.772	0.000***
Technological Factor	0.318	0.045	0.322	7.116	0.000***
R square			57.6%		
Adjusted R square			57.2%		
F-test (p-value)			153.9507 (<0.01)		

CONCLUSION AND RECOMMENDATION

This paper attempted to analyse the relationship between gender, age, academic level, and some non-demographic factors which might influence online learning satisfaction of university students in a private university. Several conclusions are being drawn based on the hypotheses of the study. Firstly, the findings of this study showed that there is significant influence of the gender factor on e-learning satisfaction of students. The study also revealed that perceived ease of use, perceived usefulness and technological factor are the factors that affect satisfaction on e-learning. This means students' characteristics and perception of e-learning may increase the level of satisfaction among the students when they are engaged in e-learning in the university. Students who have a higher level of understanding about the application of e-learning courses tend to demonstrate a higher satisfaction level during the learning stage. The questionnaire is well developed and reliable to explore the use of e-learning among university students and their satisfaction level. Furthermore, an equation model was constructed in this study for quantitative analysis to predict the relationship between various potential indicators. This model can be used to predict student satisfaction of learning in various e-learning platforms, and the accuracy of reliability is 57.6%. The model is considered as highly reliable.

To improve students' satisfaction towards e-learning in the future, there is a pressing need to increase awareness about the importance of e-learning across all levels of education in Malaysia. Educators must be actively involved in motivating students to adapt to the e-learning process, and students need to be guided closely to experience the full benefits of e-learning while adjusting to the new normal. Currently, there is a lack of effective platforms to provide seamless interaction close to the traditional classroom setting. Therefore, the current e-learning platform and infrastructure providers must improve the interactive elements to enhance the quality and efficiency of e-learning education in Malaysia.

REFERENCES

Abu-Shanab, E. A. (2011, March). Education level as a technology adoption moderator. Paper presented at 2011 3rd International Conference on

- Computer Research and Development in Shanghai, China. DOI: 10.1109/ICCRD.2011.5764029
- A.B. Nassuora. (2013). Students acceptance of mobile learning for higher education in Saudi Arabia. *International Journal of Learning Management System*, 1(1), 1–9. DOI: 10.12785/ijlms/010101
- Agarwal, R., and Prasad, J. (1999). Are individual differences germane to the acceptance of new information technologies? *Decision Sciences*, 30(2), 361-391. <https://doi.org/10.1111/j.1540-5915.1999.tb01614.x>
- Ahmed, M.H.S. (2010). Hybrid E-Learning Acceptance Model: Learner Perceptions. *Decision Sciences Journal of Innovative Education*, 8(2), 313-345.
- Al-Azawei A., Parslow P., and Lundqvist K. (2017). Investigating the effect of learning styles in a blended e-learning system: an extension of the technology acceptance model (TAM). *Australasian Journal of Education Technology*, 33(2), 1–23. DOI: 10.14742/ajet.2758
- Alrafi, A. (2009). Technology Acceptance Model. In: Alrafi, A. (Ed.) *Information Systems Adoption: A Study of the Technology Acceptance Model*. VDM Verlag.
- Al-Samarraie, H., H. Selim, T. T., and Zaqout, F. (2016). Isolation and Distinctiveness in the Design of E-learning Systems Influence User Preferences. *Interactive Learning Environments*, 25(4), 1–15. DOI: 10.1080/10494820.2016.1138313
- Arbaugh, J. B., and Duray, R. (2002). Technological and structural characteristics, student learning and satisfaction with web-based courses an exploratory study of two on-line MBA programs. *Management Learning*, 33(3), 331-347. DOI: 10.1177/1350507602333003
- Beqiri, M. S., Chase, N. M., and Bishka, A. (2010). Online Course Delivery: An Empirical Investigation of Factors Affecting Student Satisfaction. *Journal of Education for Business*, 85(2), 95-100. <https://doi.org/10.1080/08832320903258527>

- Bhattacharjee, A. (2001). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *Management Information System Quarterly*, 25(3), 351-370. <https://doi.org/10.2307/3250921>
- Boyte-Eckis, L., Minadeo, D. F., Bailey, S. S., and Bailey, W. C. (2018). Age, gender, and race as predictors of opting for a midterm retest: A statistical analysis of online economics students. *The Journal of Business Diversity*, 18(1), 17–28.
- Burton-Jones, A., and Hubona, G. S. (2006). The mediation of external variables in the technology acceptance model. *Information & Management*, 43(6), 706-717. <https://doi.org/10.1016/j.im.2006.03.007>
- Cai, Z., Fan, X., and Du, J. (2017). Gender and attitudes toward technology use: A meta-analysis. *Computers & Education*, 105, 1–13. <https://doi.org/10.1016/j.compedu.2016.11.003>
- Chanchary, F.H., and Islam, S. (2011, December). Mobile learning in Saudi Arabia – prospects and challenges. Paper presented at the International Arab Conference on Information Technology (ACIT'2011), Zarqa University, Jordan.
- Chang, I. H., and Chen, R. S. (2020). The impact of perceived usefulness on satisfaction with online parenting resources: The mediating effects of liking and online interaction. *Asia-Pacific Education Researcher*, 29, 307–317. <http://dx.doi.org/10.1007/s40299-019-00484-y>
- Chang, H. H., and Wang, H. W. (2008). The relationships among e-service quality, value, satisfaction and loyalty in online shopping. *European Advances in Consumer Research*, 8, 10-15.
- Chen, T., Peng, L., Yin, X., Rong, J., and Cong, G. (2020). Analysis of user satisfaction with online education platforms in China during the COVID-19 pandemic. *Journal of Healthcare*, 8(200), 1-26.

- Chung, J. E., Park, N., Wang, H., Fulk, J., and McLaughlin, M. (2010). Age differences in perceptions of online community participation among non-users: An extension of the technology acceptance model. *Computers in Human Behavior*, 26(6), 1674-1684. DOI: 10.1016/j.chb.2010.06.016.
- Chiu, C. M., Chang, C. C., Cheng, H. L., and Fang, Y. H. (2009). Determinants of customer repurchase intention in online shopping. *Online Information Review*, 33(4), 761-784. DOI: 10.1108/14684520910985710
- Cole, M.T., Shelly, D. J., and Swartz, L. B. (2014). Online instruction, e-learning, and student satisfaction: A three year study. *The International Review of Research*, 15(6), 112-131. DOI: 10.19173/irrodl.v15i6.1748
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340. DOI: 10.2307/249008
- Devaraj, S., Fan, M. M. and Kohli, R. (2002). Antecedents of B2C channel satisfaction and preference: Validating e-commerce metrics. *Information Systems Research*, 13(3), 316-333. DOI: 10.1287/isre.13.3.316.77
- DeLone, W. H., and McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9-30. DOI: 10.1080/07421222.2003.11045748
- Folorunso, O., Ogunseye, O.S., and Sharma, S.K. (2006). An exploratory study of the critical factors affecting the acceptability of e-learning in Nigerian universities. *Information Management and Computer Security*, 14(5), 496-505. DOI: 10.1108/09685220610717781
- Gomez, F.G., Guardiola, J., Rodriguez, O.M., and Alonso, A. N. (2011). Gender difference in e-learning Satisfaction. *Computer & Education Journal*, 58(12), 283-290. DOI: 10.1016/j.compedu.2011.08.017
- He, J., and Freeman, L. A. (2010). Are men more technology-oriented than women? The role of gender on the development of general computer

- self-efficacy of college students. *Journal of Information Systems Education*, 21(2), 203-212.
- Jennings, S. E. and Onwuegbuzie, A. J. (2001). Computer attitudes as a function of age, gender, math attitude, and developmental status. *Journal of Educational Computing Research*, 25(4), 367-384. <https://doi.org/10.2190/WH2L-BBVB-DTPG-UG7R>
- Khogali, S. E., Davies, D.A., Donnan, P.T., Gray, A., Harden, R.M., and McDonald, J. (2011). Integration of e-learning resources into a medical school curriculum. *Med Teach*, 33(4), 311-318. DOI: 10.3109/0142159X.2011.540270.
- Kuo, Y-C., and Belland, B. R. (2016). An exploratory study of adult learners' perceptions of online learning: Minority students in continuing education. *Educational Technology Research and Development*, 64(4), 661-680. <https://doi.org/10.1007/s11423-016-9442-9>
- Lee, C., Yeung, A. S., and Ip, T. (2016). University English language learners' readiness to use computer technology for self-directed learning. *System*, 67, 99-110. DOI: 10.1016/J.SYSTEM.2017.05.001
- Lin, W. B. (2008). Construction of on-line consumer behavior models: a comparative study of industries in Taiwan. *International Journal of Commerce and Management*, 18(2), 123-149. DOI: 10.1108/10569210810895221
- Lymperopoulos, C., and Chaniotakis, I. E. (2005). Factors affecting acceptance of the internet as a marketing-intelligence tool among employees of Greek bank branches. *International Journal of Bank Marketing*, 23(6), 484-505. DOI: 10.1108/02652320510619602
- Manuel, C.G., Maria, E.R.M., and Juan, D.M. (2010). Are there gender differences in e-learning use and assessment? Evidence from an interuniversity online project in Europe. *Procedia Social and Behavioral Sciences*, 2(10), 367-371. <https://doi.org/10.1016/j.sbspro.2010.03.027>

- Mohammadi, H. (2015). Investigating users' perspectives on e-learning: An integration of TAM and IS success model. *Computers in Human Behavior*, 45, 359-374. <https://doi.org/10.1016/j.chb.2014.07.044>
- Morin, D., Safaee, H., and Saadé, R. (2019). Understanding online learning based on different age categories. *Issues in Informing Science and Information Technology*, 16, 307-317. <https://doi.org/10.28945/4313>
- Pavlou, P. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce* 7(3),101-134. <https://doi.org/10.1080/10864415.2003.11044275>
- Pilli, A. O., Fanaeian, A. Y., and Al-Momani, M. M. (2014). Investigating the students' attitude toward the use of e-learning in Girne American University. *International Journal of Business and Social Science*, 5(5), 169-175.
- Pituch, K. A., and Lee, Y. K. (2006). The influence of system characteristics on e-learning use. *Computers & Education*, 47, 222–244. <https://doi.org/10.1016/j.compedu.2004.10.007>
- Poon, W.C., Low, L.T., and Yong, G. F. (2004). A study of Web-based learning (WBL) environment in Malaysia. *The International Journal of Educational Management*, 18(6), 374-385. DOI: 10.1108/09513540410554031
- Rafaeli, S., and Sudweeks, F. (1997). Networked interactivity. *Journal of Computer-Mediated Communications*, 2(4). <https://doi.org/10.1111/j.1083-6101.1997.tb00201.x>
- Seliaman, M.E., and Al-Turki, M.S. (2012). Mobile learning adoption in Saudi Arabia. *World Academy of Science, Engineering, and Technology*, 69, 391–393.
- Selim, H.M. (2005). Critical success factors for e-learning acceptance: Confirmatory factor models. *Computers and Education*. DOI:10.1016/j.compedu.2005.09.004

- Shahzad, A., Hassan, R., and Aremu, A.Y. (2021). Effects of COVID-19 in E-learning on higher education institution students: the group comparison between male and female. *Quality & Quantity*, 55, 805-826. <https://doi.org/10.1007/s11135-020-01028-z>
- Stoel, L., and Lee, K.-H. (2003). Modelling the effect of experience on student acceptance of Web-based courseware. *Internet Research*, 13(5), 364-374. <https://doi.org/10.1108/10662240310501649>
- Sun, H., and Zhang, P. (2006). The role of moderating factors in user technology acceptance. *International Journal of Human-Computer Studies*, 64(2), 53-78. <https://doi.org/10.1016/j.ijhcs.2005.04.013>
- Tarhini, A., Hone, K., and Liu, X. (2014). The effects of individual differences on e-learning users' behaviour in developing countries: A structural equation model. *Computers in Human Behavior*, 41, 153-163. DOI: 10.1016/j.chb.2014.09.020
- Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478. DOI: 10.2307/30036540
- Wheeler, S. (2012). E-learning and digital learning, In: Seel, N.M. (Ed.), *Encyclopaedia of the Sciences of Learning*, Springer US. https://doi.org/10.1007/978-1-4419-1428-6_431
- Wisanti, Ambawati, R., Putri, E. K., Rahayu, D. A., and Khaleyla, F. (2020). Science online learning during the covid-19 pandemic: Difficulties and challenges. *Journal of Physics: Conference Series*, 1747, 1-7.
- Yee, H. T. K., Luan, W. S., Ayub, A. F. and Mahmud, R. (2009). A review of the literature: determinants of online learning among students. *European Journal of Social Sciences*, 8(2), 246-252.