THE EFFECT OF TECHNOSTRESS ON ONLINE LEARNING BEHAVIOUR AMONG UNDERGRADUATES

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ABSTRACT

Purpose – Students' incompetence to deal with the intricacies of technology during the teaching and learning process may have negatively affected their online learning process particularly throughout the COVID-19 pandemic. It is critical to research technostress influence on online learning behaviours among undergraduates. Thus, this research intends to examine the predicting factors that contribute to technostress and the correlation between undergraduates' technostress and the behavioural intention to use online learning.

Methodology – This study employed an online survey and cross-sectional data towards 212 respondents, all of whom were Diploma students from Universiti Teknologi MARA (UiTM) Pahang. This study added three new variables to the existing Unified Theory of Acceptance and Use of Technology (UTAUT) namely teaching-related aspects, price value, and technostress. Structural equation modelling (SEM) was performed to analyse the measurement model and evaluate the developed hypotheses.

Findings – The findings established a significant correlation between technostress and behavioural intention to use online learning. Facilitating conditions also demonstrate a significant relationship to technostress.

Significance - The study's findings are likely to increase researchers' understanding of the present condition of technostress in higher education as a consequence of the implementation of online learning regulations, as well as the scale of the impacts on higher education.

Keywords: Behavioural intention, Online learning, Technostress, Undergraduates, UTAUT.

INTRODUCTION

Advancement in Information and Communications Technology (ICT) has dramatically changed people in countless facets, both in positive and negative ways. While the benefits of ICT are considered a countless blessing and vital to every aspect of human activities, its potential side effects can be detrimental. The drawbacks of ICT are commonlylinked to an emerging type of stress known as technology stress or technostress (Zhao et al., 2020). This kind of stress is mainly associated with poor usage of and bad experience with ICT and is considered an emerging study particularly within the context of individual and organisational settings (Tarafdar et al., 2019). Research has demonstrated that technostress has been constituted as a form of a contemporary disease, as individuals who have trouble using ICT have been reported to experience many health problems and consequently jeopardise their well-being (Nimrod, 2018). The existence of technostress in the workplace is evident in the literature and has explained its negative consequences to organisational operation and output (Tarafdar et al., 2011). The technostress symptoms are assumed to be a contagious threat across technology users in various fields.

Although there is plenty of research underpinning the concept of technostress in the workplace environment, only a handful of research examines the antecedents and consequences of technostress towards university students (Upadhyaya & Acharya, 2020; Wang & Li, 2019). The adoption, transmission, and advancement of ICT have changed rapidly since 1988 in all sectors including education. Integration of ICT may improve the teaching experience, the quality of higher education, and the academic accomplishment of students (Shaheen & Khatoon, 2017). Notwithstanding, the intricacies of technology linked to ICT usage in the teaching and learning methodology may have contributed to students' incapability of dealing with the remarkably complex technological advancements in a healthy manner, potentially resulting in health issues such as recurring vision problems, headaches, hypertension, cardiovascular problems, and psychiatric illnesses (Fook et al., 2021; Park et al., 2020; Tams et al., 2013). The recent COVID-19 outbreak has caused a dramatic shift in the Malaysian educational landscape as the online learning policy has been fully implemented to substitute the conventional direct teaching and learning methods (Solhi, 2020). The so-called remote instruction to achieve learning objectives in times of uncertainty and face-to-face class interruptions is considered an emerging solution to higher education worldwide (Ali, 2020; Mahmud et al., 2021). Apparently, without system readiness and user competencies, which are the keys to a successful ICT adoption, students are required to continue learning at home without direct contact with the instructors and peers to complete their course assessments (Allam et al., 2020). Whether they have access to proper learning equipment and online learning skills or not, the teaching and learning process continues to be enforced via remote learning (Morgan, 2020; Reich et al., 2020) by which technostress incidents are more likely to occur. The topic is important as university students are currently having a hard time enduring online learning activities, which have been associated with poor academic performance (Upadhyaya & Acharya, 2020; Zhao et al., 2020).

Due to the potential magnitude of destruction from technostress, this study aims to provide an insight into how technostress is associated with online learning behaviour among students at Universiti Teknologi MARA Pahang. The key purpose of the study includes investigating the predictors that cause technostress in the online learning behaviour of undergraduate students and subsequently investigating the link between technostress and behavioural intention to use online learning.

The study's results are anticipated to raise researchers' knowledge of the present situation of technostress in higher education as a result of the implementation of online learning policy and assist them in comprehending the magnitude of the influence in higher education setting.

LITERATURE REVIEW

Underpinning Theory

Venkatesh et al. (2003) established the Unified Theory of Acceptance and Use of Technology (UTAUT), as represented in Figure 1, to describe behavioural intentions of using technology and successive activities. According to this notion, performance expectancy, effort expectancy, social influence, and facilitating conditions variables are all immediate predictors of behavioural intention and eventually result in users' behaviour. Gender, age, experience, and the voluntariness of use all act as moderators of these notions (Venkatesh et al., 2003).

Figure 1

The Original Model of Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003).
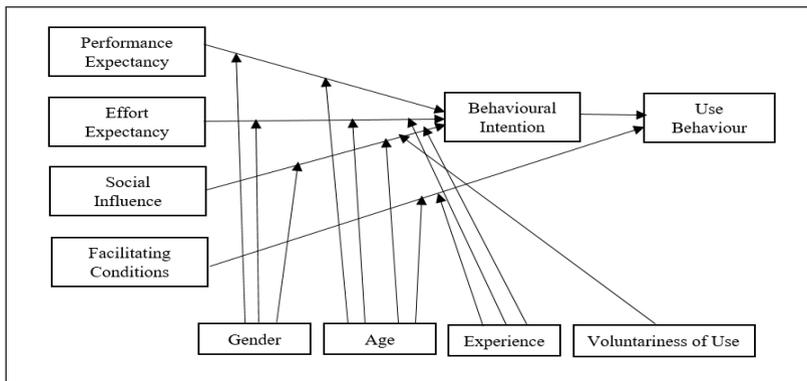
Numerous academics have adapted UTAUT's initial model to analyse Jordanian students' adoption of mobile learning technologies (Almaiah et al., 2019), to inspect the elements that promote the reception of blended learning among Iranian medical students (Azizi et al., 2020), to examine the aspects that stimulate the success of online learning in

Saudi Arabia (Solangi et al., 2018), and to investigate the technological implementation of massive open online courses in Malaysian public universities (Haron et al., 2020). Nevertheless, there have been criticisms of the original model of UTAUT. Bagozzi (2007) stated that although UTAUT is a well-intentioned and intelligent presentation, it proposes a model with 41 separate factors to predict intent and at least eight independent variables to predict behaviour. It has aided in the research of technological assimilation in "reaching a stage of chaos" (Bagozzi, 2007, p.245). Moreover, it has been contended that UTAUT is less practical than the previous Technology Acceptance Model owing to its high R^2, which can be attained only when key connections are moderated by up to four factors (Van Raaij & Schepers, 2008). As a result, the original model of UTAUT's mediating factors, such as gender, age, experience, and willingness to use, is omitted from this research. However, the UTAUT model is proven to be a useful measurement model for educational technologies in higher education (Ain et al., 2015). Almugbel (2020) suggested that updating the research model and adding variables can gain a deeper understanding of technologies and structures in educational settings. Therefore, this study introduces a few new constructs, namely teaching-related aspects, price value, and technostress as the extension of the existing UTAUT since they are needed to extend this model by adding new constructs. Then again, UTAUT has been in use for over a decade and is widely utilised in information systems (IS) and other domains (Venkatesh et al., 2016).

Teaching-Related Aspects

Teaching-related aspects concern pedagogy, class contact hours, lecturers' competency, the commitment of lecturers, and lecturers' knowledge and ability to explain well. According to the concept of Technical Pedagogical Content Knowledge (TPACK), it is ideal to employ specialised technological instruments such as hardware, software, apps, and related information literacy practises to aid students in gaining a better grasp of the subject matter. Misha and Koehler (2006) stated that this framework recognises three distinct knowledge forms: technical knowledge, pedagogical knowledge, and content knowledge. These three types of knowledge are mixed differently in the context of TPACK. To properly leverage the technology, teaching and learning through online learning entail the creation of appropriate and engaging content (He et al., 2019). Previous studies have examined the teaching-related aspects of online learning. As

posited by Dhawan (2020), teachers should humanise online learning processes to the maximum level. This includes providing personal attention to students and establishing social media and group forums for effective communication. Appropriate teaching approaches are essential to ease an effective and efficient learning process. Various content formats incorporating online technology, such as virtual meetings, are also useful in getting feedback and maintaining students' engagement. Additionally, the content of online courses should be student-oriented, creative, and interactive (Partlow & Gibbs, 2003). Furthermore, teachers need to acquire skills in conveying effective online instructions to enhance feedback, encourage participation, and provide a better understanding of the course content (Keeton, 2004). A teacher's poor explanation during online delivery causes incomplete tasks and leads to boredom and stress among students (Juliawati & Yandri, 2018). Therefore, it is postulated that:

H1: There is a significant relationship between teaching-related aspects and technostress

Social Influence

Singh et al. (2020) mentioned that social influence is a significant factor that determines students' behavioural intentions. As stated in UTAUT, this factor is described as "the degree to which an individual perceives that it is important others believe he or she should use the new system" (Venkatesh et al., 2003). Three variables of social influence shape individual behaviour including social norm, social factors, and image. The formation of a social norm is based on a person's impression of societal burden to execute a behaviour or otherwise. Many studies have shown that social influence serves a substantial function in the adoption of a new system since it is impacted by surroundings and individuals. Conceivably, it is verified as a critical variable in predicting the usage intention in the study's various settings, including mobile learning, social media usage, and ICT adoption in education (Nawaz & Mohamed, 2020; Williams et al., 2021). Attuquayefio and Addo (2014) investigated students' attitudes toward ICT use and discovered that social influence favourably affected behavioural intentions to use ICT for studying. Haron et al. (2020) also found that social influence had a major impact on students' willingness to use MOOC technology, particularly at public universities. Meanwhile, a study by Bharati and Srikanth (2018) discovered that social influence had a negligible consequence on students' intentions of using technology

in their learning. Other factors such as individual personality, self-confidence, and learning experience of the student can also influence the ability to learn and their behaviour to use the technology. Social influence may also contribute to technostress when consumers need enough experience to feel confident about making decisions. It is perceived that family and acquaintances have confidence in their use of a certain technological advancement. Therefore, it is important to examine the effects of social influence on technostress in the online learning environment. Goetz and Boehm (2020) found that the role of social support will reduce technological insecurity. On the basis of the above argument, it is hypothesised that:

H2: There is a significant relationship between social influence and technostress

Price Value

Quality, cost, and price impact technological choices, hence, price value is a substantial factor in forecasting behavioural intention to use online learning. According to Kumar et al. (2015), the price range of technology determines the ability and purchase decision of an individual. Venkatesh et al. (2012) stated that when the advantages of technology adoption outweigh the costs, a price value may have a beneficial effect on behavioural intention. Azizi et al. (2020) stated that price value has a beneficial impact on the behavioural intention of Iranian medical science students in adopting blended learning. The ability to acquire blended learning material at a low cost and the utilisation of the internet were also significant determinants in the decision to employ the blended learning method. In addition, price value can also affect technostress. This is because the relatively high cost of purchasing computer equipment as well as Internet data is a major challenge that can hinder technology usage in the online learning development (Dhawan, 2020; Ferri et al., 2020) which can lead to technostress. A study by Ferri et al. (2020) shows that price value is a challenge in online learning as the cost of devices, such as tablets or computers, is quite expensive which can hinder the effectiveness of online learning. They have suggested the Italian government subsidise households to purchase such devices. Therefore, it is hypothesised that:

H3: There is a significant relationship between price value and technostress

Facilitating Conditions

Facilitating conditions are associated with users' impressions of the resources and assistance accessible to them in order to engage in a particular behaviour (Venkatesh et al., 2003). According to Jakkaew and Hemrungrote (2017), facilitating conditions determine students' behaviour in using online learning. They believe that online learning improves knowledge in a certain course when they are supported with the use of relevant infrastructure and technology, e.g., the internet, Wi-Fi, specific location, and information and communication technology literate. This corresponds with the results of Haron et al. (2020) and Nawaz and Mohamed (2020), demonstrating that facilitating conditions significantly influence university students' propensity of adopting mobile learning. Furthermore, an investigation by Toufaily et al. (2018) also suggests that to increase the online learning experience, the Internet infrastructure needs to be upgraded to ensure that students can get efficiently connected to their instructors and learning resources via the online learning platform. Han and Conti (2020) observed, however, that facilitating conditions are not a predictive factor of the intent to learn technology. Students use telepresence robots to make learning more effective with the influence of attitude, social, and perceived enjoyment. On the basis of the above argument, it is proposed that:

H4: There is a significant relationship between facilitating conditions and technostress

Technostress

Technostress denotes "a modern disease of adaptation caused by failure to cope with the new computer world technologies in an unhealthy manner" (Westermann, 2017). Technostress, as used in this study, denotes students' incapacity to deal with new technology used in online learning. Past studies confirmed that ICT is a contributor to stress. While the majority of research on technostress has been undertaken in workplace setting (Marchiori et al., 2019; Ragu-Nathan et al., 2008), there has been a very little study conducted in the education profession, especially with regard to university students. According to a prior research performed on Indian academics, technostress may result in issues such as discontent with learning, insufficient engagement with learning, and a decline in performance (Jena, 2015). Singh et al. (2020) also examined the impact of

technostress on students' performance in learning. According to the study, technostress has a considerable influence on students' academic achievement. The findings are consistent with a previous study in an organisational setting (Tarafdar et al., 2011; Chen, 2015). Therefore, it is hypothesised that:

H5: There is a significant relationship between technostress and behavioural intention to use online learning

Behavioural Intention

Behavioural intention denotes "a person's willingness to engage in a particular behaviour" (Dai et al., 2020). In this research, behavioural intention refers to one's intention of adopting online learning. Past researchers confirmed that behavioural intention directly affects the actual usage of the system (Venkatesh, 2003; Limayem, 2007; Jahanbakhsh et al., 2018). Azizi et al. (2020) discovered that students' behavioural intention of using blended learning is highly inclined by performance expectation, which eventually leads to actual use. This result corroborates prior research (Hoque & Sorwar, 2017; Suki & Suki, 2017; Arain et al., 2018). Tarhini et al. (2017) found that performance expectancy was one of the most important elements influencing students' behavioural intention of utilising e-learning systems in Qatar and the United States, which is consistent with previous research (Chu & Chen, 2016). Therefore, it is postulated that:

H6: There is a significant relationship between behavioural intention and the actual use of online learning

Actual Use

The actual use of online learning tech by students is determined by many factors, including students' behavioural intention to utilise it (Porter & Donthu, 2006). Based on the findings, students use online learning when they receive management support and have a positive attitude that shapes the good culture of a learning environment. In addition, a determinant like forming a habit has a favourable effect on a student's use of online learning. Moreover, Almaiah et al. (2019) discovered that perceived compatibility, self-efficacy, perceived information quality, resource availability, and behavioural intention of using online learning all had a substantial impact on the actual usage of a mobile learning system, as observed among 697 college students.

However, Azizi et al. (2020) and Almaiah et al. (2019) also exposed that the facilitating conditions showed an insignificant consequence on students' actualuse of online learning. Bing Tan (2013) investigated college students' needs for English e-learning websites to improve their performance and raise their intention to use them. The findings of this study revealed that students' actual usage of English e-learning websites was positively influenced by facilitating conditions and the intention of using. Thus, the web designer suggested improving the knowledge management function and user interface to enhance the operation of the website.

Conceptual Framework

In Figure 2, the conceptual framework for a model is shown, which illustrates the link between social influence, facilitating conditions, price value, teaching-related aspects, technostress, behavioural intention, and actual use of online learning. The current study develops a conceptual framework for analysing the factors that may reflect actual online learning usage. This study suggests that social influence, facilitating conditions, price value, and teaching-related aspects are going to significantly affect technostress, and therefore will affect students' behavioural intention and eventually their actual use of online learning.

Figure 2

Conceptual Framework
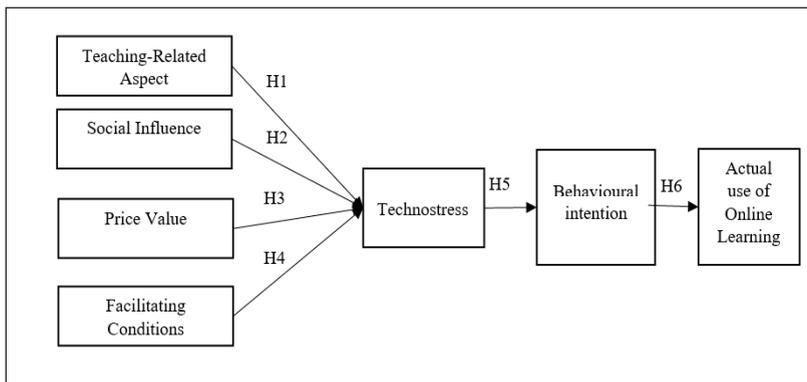
METHODOLOGY

Participants and Procedures

A total of 250 undergraduate students taking Diploma in Planting Industry Management from University Technology MARA Pahang, Malaysia, were chosen to answer the survey questionnaire. The response rate was 84.8 percent, with 212 respondents (122 males and 90 females) who completed the questionnaire. The target respondents were chosen through cluster random sampling method from the university's management classes. They began the semester with traditional face-to-face lessons, but because of the COVID-19 pandemic and the Movement Control Order (MCO), they were required to switch to open and remote learning until the semester ended. Participants' age ranged from 18 to 21 years. The questionnaires were administered thirty minutes before the Management class ended and the time given to answer the questionnaire was fifteen minutes. The respondents participated voluntarily and had already given their consent during the online briefing session.

Measures or Instrumentations

This study aimed to analyse the predictors of technostress and the correlation between technostress and the behavioural intention to utilise online learning among undergraduate students. Data collection was done using questionnaire through Google Form; the link was distributed via students' WhatsApp groups. A collection of 32 measurement items from the literature on technology acceptance was adopted and adapted for this study (Aziz & Yazid, 2021; He et al., 2019; Venkatesh et al., 2003; Kumar et al., 2015; Westermann, 2017; Singh et al., 2020; Dai et al., 2020; Porter & Donthu, 2006). Five (5) items were used to assess each of the predictors, namely, price value, facilitating conditions, and behavioural intention. The teaching-related aspect and technostress were measured using eight (8) items each. Meanwhile, social influence was measured using four (4) items. The survey participants' response to every item was graded on a ten-point Likert scale (1 = strong disagreement; 10 = strong agreement). Table 1 shows how the constructs have been operationalised.

Table 1

Operationalisation of Constructs

Variables	Items		Source
Teaching-Related Aspect	TRA1	Lecturers give me more time to learn and be comfortable with the use of ODL in the teaching and learning process.	He et al. (2019)
	TRA2	The lecturer provides opportunities for students to express their views equally.	
	TRA3	The questions raised by the lecturer in ODL are open, which can lead to discussions.	
	TRA4	The lecturer encourages and praises the students during ODL.	
	TRA5	The lecturer's questions help me to understand the course.	
	TRA6	The lecturer helps me when I have trouble with the work and assignments.	
	TRA7	When I have a different opinion from my lecturers, they provide effective guidance.	
	TRA8	When I cannot answer questions during ODL, the lecturer encourages me.	
Social Influence	SI1	People who are important to me think that I should use ODL.	Singh, et al. (2020) & Venkatesh et al. (2003)
	SI2	People who influence my behaviour would recommend using ODL.	
	SI3	People who are important to me influence my decision to use ODL.	
	SI4	Lecturers in my classes think that I should use ODL as it would help me to understand the lessons.	

(continued)

Variables	Items		Source
Price Value	PV1	ODL offers good value for the money I paid as my study fee.	Kumar et al. (2015),
	PV2	ODL provides good value.	
	PV3	The cost of using ODL is reasonable.	
Facilitating Condition	FC1	I have the resources necessary to use ODL (e.g., Wi-Fi/laptop/computer).	Venkatesh et al. (2003)
	FC2	I know the necessary to use ODL (e.g., basic computer and online learning platform knowledge).	
	FC3	I think using ODL fits well with the way I like to learn.	
Technostress	TS1	I am forced by this ODL technology to do more work and assignments than I can handle.	Westermann (2017) & Singh et al. (2020)
	TS2	I am forced by this ODL technology to do homework and assignments with very tight time schedules.	
	TS3	I am forced to change my habits to adapt to ODL technologies.	
	TS4	I have a higher number of homework and assignments because of the increased complexity of this ODL technology.	
	TS5	I need a long time to understand and use ODL technologies.	
	TS6	I often find it too complex to understand and use ODL technology.	
	TS7	I do not know enough about this ODL technology to handle it satisfactorily.	
	TS8	It is stressful to understand the functionality of ODL accurately.	

Variables	Items		Source
Behavioural Intention	BI1	I intend to continue using ODL in the next semester.	Dai et al. (2020)
	BI2	I predict I would use ODL in the next semester.	
	BI3	I know that I will use ODL in the next semester.	
Actual use	AU1	I use online learning very often.	Porter & Donthu (2006)
	AU2	I use online learning quite often for academic purposes.	
	AU3	I spend a lot of time on online learning for academic use.	

Pre-Test

The instrument validity and reliability tests were executed to ascertain the validity of the measures and to confirm that the questionnaire had a sufficiently representative group of questions. Concerning the instrument's validity, three professors from the Management Information System were requested to evaluate the items' content validity since they are regarded as academic specialists. No items were removed, and only some modifications were made to the items' sentence structures. The Cronbach's Alpha analysis was applied to measure the instrument's reliability.

Data Analysis

To test the conceptual framework and hypotheses, this research used an online survey and cross-sectional data. Confirmatory Factor Analysis (CFA) was employed to verify the compatibility between the number of factors extracted by the Exploratory Factor Analysis process that formed the pre-established theories. In other words, the CFA was used to determine the model's unidimensionality in every construct. Structural Equation Modelling (SEM) was used to ascertain which behavioural characteristics affected technostress, behavioural intention, and actual use of online learning. Besides that, the SEM's results estimated the regression weights among constructs. In other words, SEM was applied for testing all the hypotheses shown in the conceptual framework.

RESULTS AND DISCUSSION

Respondents' Profiles

This study involved 212 respondents, all of whom were Diploma students. Male students made up 57.5 percent of the responses, while female students made up the remaining 42.5 percent. Most of the respondents (99.5%) were from 18 to 21 years old. In terms of the respondents' residential areas, while pursuing online learning, 18.9 percent of students pursued online learning from urban areas, 40.1 percent from small towns or suburban areas, and 41 percent from villages or rural areas.

Confirmatory Factor Analysis (CFA)

CFA was utilised to verify the compatibility between the number of factors extracted by the Exploratory Factor Analysis process that formed the pre-established theories. In another sense, the CFA was employed to ascertain the model's unidimensionality from every construct. Figure 3 and Table 2 present the seven-factor CFA where all items of social influence, facilitating conditions, price value, teaching-related aspect, technostress, behavioural intention, and actual use constructs were specified to load onto their respective factors.

Figure 3

The CFA Results
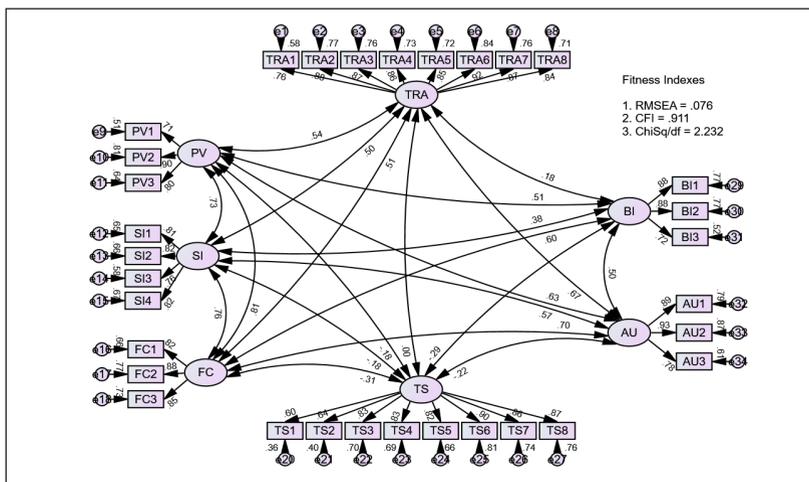
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Notes: N = 212; TRA = Teaching-Related Aspect; PV = Price Value; SI = Social Influence; FC = Facilitating Condition; TS = Technostress; BI = Behavioural Intention; AU = Actual Use

Table 2

Goodness-of-fit Indices

Name of Category	Goodness-of-fit Measures	Acceptable Value	Index Value
Absolute fit	RMSEA	< 0.08	0.08
Incremental fit	CFI	> 0.90	0.91
Parsimonious fit	ChiSq/df	< 3.00	2.23

The results from Figure 3 and Table 2 present the root mean square error of approximation (RMSEA) = 0.08, comparative fit index (CFI) = 0.91, and chi-square degree of freedom (ChiSq/df) = 2.23. The results indicate that this model displays a reasonably good fit for the observed data.

Convergent Validity

The results from Figure 3 also provide evidence of good convergent validity. It can be identified by looking at all items for each construct that has shown factor loadings greater than 0.50 (Hair et al., 2019; Zainudin, 2014). The outcome of composite reliability (CR) in Table 3 demonstrates that all constructs have strong internal consistency. The findings also show the construct's reliability as well as the average variance score derived from various factors obtained. In Table 3, the Composite Reliability (CR) of all constructs is shown to have factor loadings above the 0.60 threshold value (Zainudin, 2014), ranging from 0.85 to 0.95. The AVE of all constructs exceeds 0.5 (Hair et al., 2019; Zainudin, 2014), ranging from 0.55 to 0.76, additionally reinforcing convergent constructs' validity. We concluded the construct validity by fulfilling convergent validity.

Table 3

Average Variance Extracted (AVE) and Composite Reliability (CR) of Confirmatory Factor Analysis

Construct	Items	Composite Reliability (CR ≥ 0.6)	The average variance extracted (AVE ≥ 0.5)
Social Influence	4	0.88	0.66
Facilitating Condition	3	0.89	0.72
Price Value	3	0.85	0.65
Teaching-Related Aspect	8	0.95	0.60
Technostress	8	0.94	0.55
Behavioural Intention	3	0.87	0.69
Actual Use	3	0.90	0.76

Discriminant Validity

Table 4 demonstrates the correlation values between the constructs. It showed that the diagonal values (in bold) are greater than the values in the row and column. This result exemplifies that discriminant validity standards are met when the square root of the extracted average variance (AVE) within each construct (in bold) is larger than the correlation factors between the construct and all other constructs (Zainuddin, 2014). With satisfying discriminant validity, the construct validity is concluded. In conclusion, the model is fit to the observed data with significant path coefficients and satisfactory reliability and validity.

Table 4

Discriminant Validity

	SI	FC	PV	TRA	TS	BI	AU
SI	**0.80**						
FC	0.76	**0.85**					
PV	0.73	0.18	**0.81**				
TRA	0.50	0.51	0.54	**0.77**			

(continued)

|	SI	FC	PV	TRA	TS	BI	AU
TS	0.18	0.31	0.18	0.00	**0.74**		
BI	0.38	0.60	0.51	0.18	0.29	**0.83**	
AU	0.57	0.70	0.63	0.67	0.22	0.50	**0.87**

Notes: TRA = Teaching-Related Aspect; PV = Price Value; SI = Social Influence; FC = Facilitating Condition; TS = Technostress; BI = Behavioural Intention; AU = Actual Use; the diagonal values (in bold) are the square root of the average variance extracted (AVE). Values in the off-diagonals are the correlations among constructs, which is the values are extracted from Figure 3.

Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) was applied to determine which behavioural characteristics influenced technostress, behavioural intention, and actual online learning usage. Besides that, the SEM's results estimated the regression weights among constructs. In other words, SEM was utilised to test all hypotheses shown in the conceptual framework. The standardised route coefficients are shown in Figure 4, while the standardised regression weights and their significance are listed in Table 5.

Figure 4

The Standardised Path Coefficients (Direct Relationship)
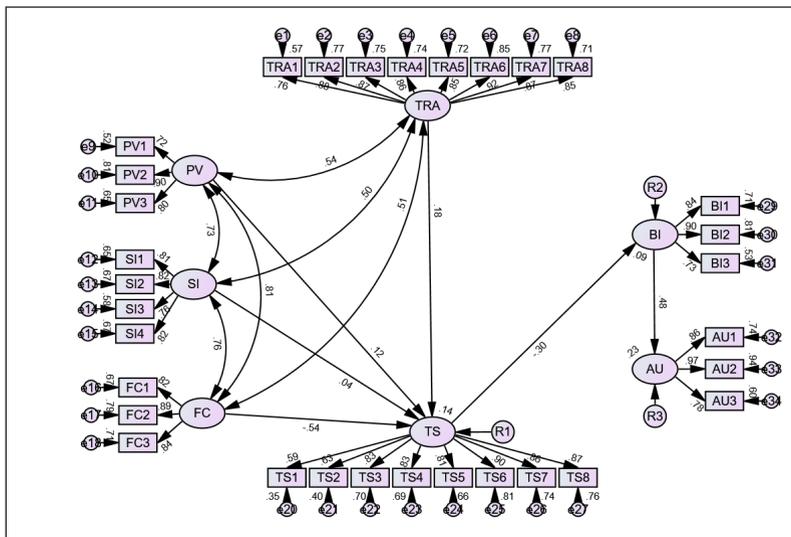
Notes: N = 212; TRA = Teaching-Related Aspect; PV = Price Value; SI = Social Influence; FC = Facilitating Condition; TS = Technostress; BI = Behavioural Intention; AU = Actual Use

Table 5

The Standardised Regression Weights and Its Significance

	Paths			Estimate	S.E.	C.R.	P	Results
H1	TRA	→	TS	.254	.119	2.122	.034	Significant
H2	SI	→	TS	.141	.186	.762	.446	Not significant
H3	PV	→	TS	.049	.151	.326	.745	Not significant
H4	FC	→	TS	-.596	.186	-3.202	.001	Significant
H5	TS	→	BI	-.313	.078	-4.033	***	Significant
H6	BI	→	AU	.406	.063	6.464	***	Significant

Notes: N=212; *Significant at the p<0.05; *** Significant at the p<0.001; TRA = Teaching-Related Aspect; PV = Price Value; SI = Social Influence; FC = Facilitating Condition; TS = Technostress; BI = Behavioural Intention; AU = Actual Use

Table 5 displays the results of the hypotheses tested. The teaching-related aspect does affect technostress while using online learning (β = 0.254, p >.005). Therefore, *H1: There is a significant relationship between teaching-related aspects and technostress* is accepted. It can be concluded that the teaching-related aspect does influence technostress among students in using online learning even though there is a lot of support and encouragement from lecturers. Another explanation seems to be that even though lecturers provide additional time for students to become acquainted and comfortable with using online learning in the teaching and learning procedures, students are still unable to adapt to the current pedagogy of online learning, especially on different digital platforms, due to their unfamiliarity. This study's findings contradict those of He et al. (2019), who discovered no statistically significant correlation between teaching-related factors and technostress, despite the fact that lecturers should assist students in becoming familiar with the online learning platform they are using, in order to minimise technostress.

The study also discovers that social influence does not have an impact on technostress in using online learning (β = 0.141, p >.005). Thus, *H2: There is a significant relationship between social influence and technostress* is rejected. This finding indicates that technostress is

not influenced by other people. Technostress comes from individuals who are not IT literate and technology savvy. Attitude also plays an important role in technostress. This means that if the students are lazy to learn new technology, such as online learning platforms, they will lag compared to their peers, which leads to technostress. Furthermore, the majority of the respondents admit that the decision to use online learning is not influenced by other people or friends since it is compulsory throughout the COVID-19 outbreak. Furthermore, the majority of respondents agreed that other people or friends do not influence their decision to use online learning because it has been compulsory to use such platforms for teaching and learning throughout the COVID-19 lockdown. Unfortunately, this study's finding contradicts previous research (Attuquayefio & Addo, 2014; Haron et al., 2020), which reveals that there is a substantial correlation between social influence and technostress.

Hypothesis *H3: There is a significant relationship between price value and technostress* is also not supported ($\beta = 0.049$, p $>.005$). This insignificant relationship demonstrates that the cost of using online learning does not have an impact on technostress. This might be since the Malaysian government has provided a free 1 Gigabyte (1GB) internet quota per day for all Malaysian students to supplement online teaching and learning. The ability to access online learning services at a reasonable cost and the usage of the internet are not the key factors in the choice to use online learning in teaching and learning procedures. Furthermore, the benefits that can be obtained from online learning, such as flexible schedule and environment, convenience, ease of use, and accessibility, are more than the cost incurred in purchasing online gadgets and equipments such as laptops, Wi-Fi, modem, and internet subscription fee. The majority of the respondents agree that online learning provides good value for money and the cost of using online learning is reasonable. Thus, price value does not affect the amount of technostress associated with online learning, contrary to earlier results by Ferri et al. (2020), who indicated that price value is one of the problems associated with online learning throughout the COVID-19 lockdown, resulting in technostress.

This study also discovers that the facilitating condition and technostress while using online learning show a negative significant relationship ($\beta = -0.596$, p=.001). Thus, H4 is supported, i.e., *there is a significant relationship between facilitating condition and technostress*. The negative relationship means that a decrease in facilitating conditions

will increase technostress. This finding demonstrates that facilitating conditions have a significant influence in determining technostress. The absence of infrastructure and technology necessary for the usage of an online learning system, such as Wi-Fi, laptops, PCs, and virtual education platforms, contributes to students' technostress. The most common issue about the lack of facilitating conditions is internet problem or inaccessibility of internet connection particularly for students located in rural areas, thus, leading to technostress. However, this result contradicts Han and Conti's (2020) findings, which revealed that the facilitating condition is not an immediate factor of technostress. Students utilise telepresence robots to make learning more effective with the influence of attitude, social influence, and perceived enjoyment.

For H5, technostress is negatively significant to behavioural intention of using online learning (β = -0.313, p = 0.000). Thus, *H5 is also supported*, i.e., *there is a significant relationship between technostress and behavioural intention to use online learning*. These negative correlations imply that the lower the technostress level, the greater the students' behavioural intention of engaging in online learning, as the majority of respondents said that they do not find the online learning platform very complicated to grasp and use. Furthermore, as all respondents are from Generation Y, they do not need a long time to grasp and apply the online learning technologies because they are all IT literate and well-versed in technology. Therefore, it should not be a problem for them to adopt technology in teaching and learning procedures and they do not feel stressed with the need to understand the functionality of online learning accurately. This finding is similar to previous research (Jena, 2015), which discovered that dissatisfaction with learning and inadequate involvement in learning may impact technostress, hence decreasing students' behavioural intention of using online learning.

Finally, this study also discovers an association between behavioural intention and the actual use of online learning (β=0.406, p<.001). Therefore, *H6: There is a significant relationship between behavioural intention and actual use of online learning* is also supported. The positive relationship means the higher the behavioural intention, the higher the actual use of online learning, indicating that students will be capable of coping with the fresh teaching and learning approaches, as the majority of students acknowledge using online learning frequently and spending a significant amount of time on the platform during the

COVID-19 pandemic. This situation may be because students feel good and are excited using online learning because they can learn from anywhere and in a flexible environment, allowing them to enjoy the learning process, resulting in a reduction in technostress and mental stress. This result corroborates a recently conducted research (Azizi et al., 2020), which demonstrated a link between behavioural intention and actual online learning usage.

CONCLUSION

The aim of this study was to evaluate a UTAUT model for the purpose of conceptualising the reasons and consequences of technostress from undergraduate students' viewpoint. The findings of this research are likely to offer new information to the field of technostress and to the body of knowledge, as three novel constructs, i.e., technostress, price value, and teaching-related aspects, are included in the current UTAUT model. It was discovered that the price value or the cost of using online learning does not have so much impact on technostress since students receive support in terms of free internet quota from the government to undergo online learning besides the benefits that can be obtained from online learning which are more than the cost incurred. The significant result of teaching-related aspects on technostress indicates that more encouragement, support, and guidance need to be done by lecturers to enhance the knowledge of various platforms used for online learning which will reduce students' technostress. The role of facilitating conditions significantly affects technostress among students as poor technology conditions lead to higher technostress incidents. This finding theoretically contributes to the inclusive factors associated with technostress among university students for future studies. Another significant finding from the study, which is theoretically important, is that technostress significantly demotivates students from intending and using online learning for participating in academic activities.

The findings provide some practical values to policy designers and the university administration. They must be aware of the potential negative side effects of online learning when the usage of ICT is intensified. Without appropriate facilitating conditions, students will be exposed to a stressful learning environment that is considered detrimental to their mental health. Online learning can be an interactive and effective way of teaching and learning, yet the university administrators should

realise that technology readiness and ensuring competencies of both students and instructors are the key factors to a successful ICT adoption. At the end of the day, academic achievement and successful delivery of knowledge matter most for better development and quality of the education system.

LIMITATIONS AND RECOMMENDATIONS

Several limitations have been established and addressed in this study. Only respondents from the Universiti Teknologi MARA Pahang are included in this study. As a consequence, the study's conclusions cannot be extrapolated since it excludes other institutions of higher education. Future studies should include students from other higher education institutions, whether private or public so that the findings can be generalised. Furthermore, this research looks at students' technostress against online learning without taking into account the types of courses they are enrolling in and their home environment including the accessibility of their internet connection that will lead to technostress. Hence, future studies should consider the types of courses taken and the external environment, which could yield different results.

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REFERENCES

Ain, N., Kaur K., & Waheed, M. (2015). The influence of learning value on learning management system use: An extension of UTAUT2. *Information Development*, 1–16. https://doi.org/10.1177/0266666915597546

Ali, W. (2020). Online and Remote Learning in Higher Education Institutes: A Necessity in light of COVID-19 Pandemic. *Higher Education Studies*, *10*(3), 16–25. https://doi.org/10.5539/hes.v10n3p16

Allam, S. N. S., Hassan, M. S., Mohideen, R. S., Ramlan, A. F., & Kamal, R. M. (2020). Online distance learning readiness during Covid-19 outbreak among undergraduate students. *International Journal of Academic Research in Business and Social Sciences*, *10*(5), 642–657.

Almaiah, M. A., Alamri, M. M., & Al-Rahimi, W. (2019). Applying the UTAUT model to explain the students' acceptance of mobile learning system in higher education. *IEEE Access*, *7*, 174673174686.

Almugbel, T. A. (2020). *Factors affecting ADHD college students' use of learning management systems: Application of the UTAUT2 model* (Order No. 27744563) [Doctoral dissertation, Wayne State University]. ProQuest Dissertations & Theses Global.

Arain, A. A., Hussain, Z., Rizvi, W. H., & Vighio, M. S. (2018). An analysis of the influence of a mobile learning application on the learning outcomes of higher education students. *Universal Access Information Society, 17*(2), 325–334.

Attuquayefio, S. N., & Addo, H. (2014). Using the UTAUT model to analyze students' ICT adoption. *International Journal of Education and Development using Information and Communication Technology, 10*(3), 75-86.

Aziz, N. N. A., & Yazid, Z. N. A. (2021). Exploratory Factor Analysis of Technostress among University Students. *International Journal of Academic Research in Progressive Education and Development*, *10*(3), 152–158. https://doi.org/10.6007/IJARPED/v10-i3/10396

Azizi, M. S., Roozbahani, N., & Khatony, A. (2020). Factors affecting the acceptance of blended learning in medical education: Application of UTAUT2 Model. *BMC Medical Education*. *20*, 367. https://doi.org/10.1186/s12909-020-02302-2

Bagozzi, R. P. (2007). The legacy of the technology acceptance model and a proposal for a paradigm shift. *Journal of the Association for Information Systems*, *8*(4), 244–254.

Bharati, V. J., & Srikanth, R. (2018). Modified UTAUT2 model for m-learning among students in India. *International Journal of Learning and Change*, *10*(1), 5–20.

Bing Tan, P. J. (2013). Applying the UTAUT to understand factors affecting the use of English e learning websites in Taiwan. *SAGE Open*. 1–12, https://doi.org/10.1177/2158244013503837

Chen, L. (2015). Validating the technostress instrument using a sample of Chinese knowledge workers. *Journal of International Technology and Information Management*, *24*(1), 65–81.

Chu, T. H., & Chen, Y. Y. (2016). With good we become good: Understanding e-learning adoption bytheory of planned behavior and group influences. *Computers & Education, 92*(1), 37–52.

Dai, H. M., Teo, T., Rappa N. A., & Huang, F. (2020). Explaining Chinese university students 'continuance learning intention in the MOOC setting: A modified expectation confirmation model perspective. *Computer and Education. 150*. https://doi.org/10.1016/j.compedu.2020.103850

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5-22. https://doi.org/10.1177/0047239520934018

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online Learning and Emergency Remote Teaching: *Opportunities and Challenges in Emergency Situations. Societies, 10*(4), 86. https://doi.org/10.3390/soc10040086

Fook, C. Y., Narusaman, S., Aziz, N. A., Mustafa, S. M. S., & Han, C. T. (2021). Exploring the relationship between mobile addiction, interpersonal relationship, and academic behavior among young adults in tertiary institutions. *Malaysian Journal of Learning and Instruction, 18*(2), 263-299. https://doi.org/10.32890/mjli2021.18.2.10

Goetz, T. M., & Boehm, S. A.(2020). Am I outdated? The role of strengths use support and friendship opportunities for coping with technological insecurity. *Computers in Human Behavior, 107*(2020)106265,1-14. https://doi.org/10.1016/j.chb.2020.106265.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis*. 8th edition. Hampshire, United Kingdom: Cengage Learning, EMEA.

Han, J., & Conti, D. (2020). The use of UTAUT and post acceptance models to investigate the attitude towards a telepresence robot in an educational setting. *Robotics, 9*(34), 1-19. https://doi.org/10.3390/robotics9020034

Haron, H., Hussin, S., Mohd Yusof, A. R., Samad, H., & Yusof, H. (2020). Implementation of the UTAUT model to understand the technology adoption of MOOC at public universities. *International Colloquium on Computational & Experimental Mechanics. IOP Conference Series Materials Science and Engineering 1062*(1):012025. https://doi.org/10.1088/1757899X/1062/1/012025 1

He, Y., Lu, J., Huang, H., He, S., Ma, N., & Sha, Z. (2019). The effects of flipped classrooms on undergraduate pharmaceutical marketing learning: A clustered randomized controlled study. *PLoS ONE*, *14*(4): e0214624. https://doi.org/10.1371/journal. pone.0214624

Hoque, R., & Sorwar, G. (2017). Understanding factors influencing the adoption of mHealth by the elderly: An extension of the UTAUT model. *International Journal of Medical Information 10*(1), 75–84.

Jahanbakhsh, M., Peikari, H. R., Hazhir, F., & Saghaeiannejad-Isfahani, S. (2018). An investigation into the effective factors on the acceptance and use of integrated health system in the primary health-care centers. *J Edu Health Promote*, *7*(128), 1-6. https://doi.org/10.4103/jehp.jehp_32_18

Jakkaew, P., & Hemrungrote, S. (2017). The use of UTAUT2 model for understanding student perceptions using Google Classroom: A case study of Introduction to Information Technology course. Conference: 2017 International Conference on Digital Arts, Media and Technology (ICDAMT).

Jena, R. (2015). Technostress in ICT enabled collaborative learning environment: An empirical study among Indian academician. *Computers in Human Behavior, 51,* 1116-1123.

Juliawati, D., & Yandri, H. (2018). Prokrastinasi Akademik Mahasantri Ma'had Al Jami'ah IAIN Kerinci. *Jurnal Fokus Kaunseling, 4*(1), 19-26.

Keeton, M. T. (2004). Best online instructional practices: Report of phase I of an ongoing study. *Journal of Asynchronous Learning Networks*, *8*(2), 75–100.

Kumar, P., Ali, N. F., & Lim, C. L. (2015). Factors affecting acceptance & use of ReWIND: Validating the extended unified theory of acceptance and use of technology. *Interactive Technology and Smart Education*, *12*(3), 1-13. http://dx.doi.org/10.1108/ITSE-02-2015-0001

Limayem, M., Hirt, S. G., & Cheung, C. M. (2007). How habit limits the predictive power of intention: The case of information systems continuance. *MIS Quarterly, 31*(4), 705–37.

Mahmud, Y. S., & German, E. (2021). Online self-regulated learning strategies amid a global pandemic: Insights from Indonesian university students. *Malaysian Journal of Learning and Instruction, 18*(2), 45-68. https://doi.org/10.32890/mjli2021.18.2.2

Marchiori, D. M., Mainardes, E. W., & Rodrigues, R. G. (2019). Do individual characteristics influence the types of technostress reported by workers? *International Journal of Human Computer Interaction, 35*(3), 218-230.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teachers' knowledge. *Teachers College Record, 108*(6), 1017–1054.

Morgan, H. (2020) Best practices for implementing remote learning during a pandemic, the clearing house. *A Journal of Educational Strategies, Issues and Ideas, 93*(3), 135-141. https://doi.org/ 10.1080/00098655.2020.1751480

Nawaz, S. S., & Mohamed, R. (2020). Acceptance of mobile learning by higher educational institutions in Sri Lanka: An UTAUT2 Approach. *Journal of Critical Reviews, 7*(12), 1036 1049.

Nimrod, G. (2018) Technostress: Measuring a new threat to well-being in later life. *Aging & Mental Health, 22*(8), 1086-1093.

Park J-C, Kim S, Lee H. (2020). Effect of work-related smartphone use after work on job burnout: Moderating effect of social support and organizational politics. *Computers in Human Behaviour,* 105:106194. https://doi.org/10.1016/j.chb.2019.106194.

Partlow, K. M., & Gibbs, W. J. (2003). Indicators of constructivist principles in internet-based courses. *Journal of Computing in Higher Education, 14*(2), 68–97.

Porter C. E., & Donthu N. (2006). Using the technology acceptance model to explain how attitudes determine Internet usage: The role of perceived access barriers and demographics. *Journal of Business Research, 59*, 999–1007.

Ragu-Nathan, T., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of technostress for end users in organizations: Conceptual development and empirical validation. *Information Systems Research, 19*(4), 417-433.

Reich, J., Buttimer, C. J., Fang, A., Hillaire, G., Hirsch, K., Larke, L. R., & Slama, R. (2020). *Remote learning guidance from State Education agencies during Covid-19 Pandemic:* A First look. https://doi.org/10.35542/osf.io/437e2

Shaheen, S., & Khatoon, S. (2017). Impact of ICT enriched modular approach on academic achievement of biology students. *Journal of Research and Reflections in Education, 11*(1), 49-59.

Singh N. Sinha N., &. Liébana-Cabanillas F. J. (2020). Determining factors in the adoption and recommendation of mobile wallet services in India: Analysis of the effect of innovativeness, stress to use and social influence. *International Journal of Information Management, 50,* 191-205.

Solangi, Z. A., Al Shahrani, F., & Pandhian, S. M. (2018). Factors affecting Successful Implementation of eLearning: Study of Colleges and Institutes Sector RCJ Saudi Arabia. *International Journal of Emerging Technologies in Learning, 13*(6), 223-230.

Solhi, F. (2020, February 21). Classes at higher learning institutions go online until further notice. News Straits Times. https://www.nst.com.my/news/nation/2020/10/629351/classes-higher learning-institutions-go-online-until-further-notice

Suki, N. M., & Suki, N. M. (2017). Determining students' behavioural intention to use animation and storytelling applying the UTAUT model: The moderating roles of gender and experience level. *International Journal of Management Education, 15*(3), 528–38.

Tams, S., Hill, K., & Thatcher, J. (2013). NeuroIS: Alternative or complement to existing methods? Illustrating the holistic effects of neuroscience and self-reported data in the context of technostress research. *Journal of the Association for Information Systems, 15*(10), 723–753. https://doi.org/10.17705 /1jais.00374.

Tarafdar, M., Cooper, C. L., & Stich J. F. (2019). The technostress trifecta techno eustress, techno distress and design: Theoretical directions and an agenda for research. *Information Systems Journal, 29*(1), 6 – 42.

Tarafdar, M. T., Qiang R. N., & Bhanu S. (2011). Crossing to the dark side: Examining antecedents and consequences of technostress. *Communication of the ACM, 54*(9), 113 – 120.

Tarhini, A., Masa'deh R., Al-Busaidi, K., Mohammed, A. B., & Maqableh, M. (2017). Factors influencing students' adoption of e-learning: A structural equation modeling approach. *Journal of International Education in Business, 10*(2), 164-182.

Toufaily, E., Zalan, T., & Lee, D. (2018). What do learners value in online education? An emerging market perspective. *e-Journal of Business Education & Scholarship of Teaching, 12*(2), 24-39.

Upadhyaya, P., & Acharya, V. (2020). Impact of technostress on academic the productivity of university students. *Education and Information Technologies, 26*(1), 1647-1664. https://doi.org/10.1007/s10639-020-10319-9

Van Raaij, E. M., & Schepers, J. J. L. (2008) The acceptance and use of a virtual learning environment in China. *Computers & Education, 50*(3), 838-852. http://dx.doi.org/10.1016/j.compedu.2006.09.001

Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425-478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), 157-178. https://doi.org/10.2307/41410412

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2016). Unified Theory of Acceptance and Use of Technology: A Synthesis and the Road Ahead. *Journal of the Association for Information Systems, 17*(5), 328–376.

Wang, X., & Li, Bo. (2019). Technostress among University Teachers in Higher Education: A study using multidimensional person-environment misfit theory. *Frontiers in Psychology*, 10, 1791. http://doi.org/10.3389/fpsyg.2019.01791,

Westermann T. (2017). *User Acceptance of Mobile Notifications, T-Labs Series in Telecommunication Services*, https://doi.org/10.1007/978-981-10-3851-8 (E-Book)

Williams, M. L., Saunderson, I. P., & Dhoest, A. (2021). Students' perceptions of the adoption and use of social media in academic libraries: A UTAUT Study. *South African Journal for Communication Theory and Research*. https://doi.org/10.1080/02500167.2021.1876123

Zainudin, A. (2014). *A Handbook on Structural Equation Modeling. Selangor:* MPWS Rich Resources.

Zhao, X., Xia, Q., & Huang, W. (2020). Impact of technostress on productivity from the theoretical perspective of appraisal and coping processes. *Information & Management, 57*(8). https://doi.org/10.1016/j.im.2020.103265