The Mediating Role of Institutional Support on Relationship between Technology Acceptance Model (TAM) and Student Satisfaction to Use E-Learning during Covid-19 Pandemic: The Study of Private University in Malaysia

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Abstract.

In these two years, E-learning system has fully become the teaching tools of higher education institutions in Malaysia after lockdowns due to Covid-19 pandemic. Universities strive hard to work with E-learning platforms in providing an effective learning environment and rich online courses for university's students, but many research findings show that the e-learning teaching outcome is not up to expectation. This study aims to assess the role of institutional support as a mediator on the relationship between variables of Technology Acceptance Model (TAM) and satisfactions of university's student to use e-learning during COVID-19 pandemic period. Respondents are among 344 students from different study major who had to study through e-learning education amidst pandemic in private university in Malaysia. The data collected used structures questionnaire and are analyzed by using SPSS. The result of this study reveals that institutional support has partially been mediated on the relationship between satisfaction of student and variables from TAM model namely perceive usefulness and perceive ease of use. The result of this study provides an idea for higher education institution to develop successful online platform in enhancing student's learning satisfaction.

Keywords: Institutional Support, e- learning Satisfaction, TAM Model, COVID-19

Introduction

Covid-19 pandemic has brought various changes in human routine as well as our conventional learning process especially in higher learning institution. But with the emergence of technology like the internet, online meeting platform and social media; which are adequate to educators and students manage their daily learning lessons by virtual classroom. This kind of online education is supported by multimedia technology known as e-learning (Khogali, Davies, Donnan, Gray, Harden & McDonald, 2011; Wheeler, 2012). By e-learning platform, the learning process will keep going on anywhere and anytime as long as

both parties via e-learning platform cover by the internet (Al-Samarraie, Selim, & Zaqout, 2016).

The World Health Organization (WHO) officially announced COVID-19 as a pandemic on 11 March 2020, following by the government of Malaysia imposed the enforced movement control orders (MCO) on 18 March in the same year. All education levels including universities suspended all the conventional teaching methods as the way to avoid the spreading of COVID-19 viruses. Most of the higher education institutions choose fully e-learning as a learning method to ensure the continuity in acquiring knowledge and skills of students. With the flexibility and reliable learning content on the fingertips, the whole learning process with greater of information technology should create higher level of enjoyment.

Similar to the rest of developing countries in the world, education has the highest positive impacts on a country's development, hence, to investigate the students' awareness and intention of using online learning is paramount. The effectiveness of online course platforms can be measured by the strength of satisfaction from its most crucial stakeholders, the students. Thus, this empirical research intends to explore the influencing factors and also other mediating factors that influence the satisfaction of university's students on learning using online platform in Malaysia during this covid-19 pandemic period; in moving forward, would provide reasonable and helpful suggestions in constructing online education with more efficiency. At the same time, the outcomes of this research would arouse university's awareness in preparing the ideal support to help students achieve better e-learning satisfaction.

Literature Review

Perceived Usefulness (PU)

The Technology Adoption Model (TAM) defines Perceived Usefulness as the level of work improvement after adoption of a technology or system. Based on the various studies on TAM and IT-based systems, if individuals believe that adoption of a new system is helpful, able to boost their job performance and effectiveness, as well as their enhance their knowledge and skills; it will automatically encourage individuals' perceptions and behaviours to participate in the adoption and usage of the technology (Faqih, 2016). In the context of e-learning PU is considered as one of the indicators of an individual's intention to utilize e-learning (Al-Rahmi et al, 2018). In this case, the students' willingness to embrace e-learning is a crucial factor in the application and the use of e-learning that happen in their respective educational institutions.

The significance of PU has been extensively recognized in the field of higher education (Hilmi et al, 2012; Al-Rahmi et al, 2018; Nagy, 2018; Teo et al, 2019; Baber, 2021). Many research focused on e-learning such Gao and Yang (2015)'s survey on the adoption of Massive Open Online Courses (MOOCs) that show the existence of strong correlation between PU and attitude. Similar finding can be found in Rizun and Strzelecki (2020)'s study on the attitude of the Kraków University of Economics' students regarding the transition from face-to-face learning to e-learning. However, there are some scholars like Hussein (2017) who argued that perceived usefulness were not significant factors in affecting the intention to

use of E-learning. He attributed this to the fact that the majority of the students already possessed some knowledge about e-learning and felt that the technology is convenient, thus making them satisfied with it.

Perceived ease of use (PEOU)

Perceived ease of use is defined as the point which potential users expect the target system to be simple to put into practice. In other words, potential users like students do not look ahead to high difficulties to learn and apply the use of the technology (Chuttur, 2009; Surendran, 2012). Ease of use is understood as the individual's perception on the new technology that going to use will be free from any additional effort. Applying this variable to the perspective of this research, ease of use is equal to the students' perception that practising online learning will engross with minimum effort (Md Johar & Awallud, 2011). Venkatesh and Bala (2008) explain that PEOU is the level of self-confidence from the users in the use of Information Technology (IT), the level of self-confidence when applying technology does not require that high effort in its use and does not require great effort. A number of these technologies are acceptable easily but some are not. The level of acceptance and use of new technology actually is depends on the individual's perception accordingly to the level of convenience in handling this technology. The more complicated it is to apply a new technology; the less likely it is to try on it (Alomary & Woollard, 2015).

According to Venkatesh, Morris and Davis (2003) which is in line with Alomary and Woollard (2015), assessing PEOU variable, it is based on 6 key factors (computer self-efficacy, perception of external control, computer anxiety, computer playfulness, perceived enjoyment, and objective usability). Perceptions of ease of use affect the user perception on the usefulness of the new technology. When the individual evaluates that the technology is easy to use, then he will easily know how to use it in work or learning activities. Furthermore, the level of perceived ease of use on certain technology will have direct effect on the perception of usefulness an that technology. In addition, the consideration of an individual whether or not to apply the new technology will be strongly depends on the level of ease of use on it. Its finding is easier if the used technology there will be create a greater interest of the individuals to use it (Barhoumi, 2016; Khan & Woosley, 2011). Hence, the harder the technology is to apply, the lower the interest of an individual's interest in using it, and the slower the individual to adopt on it (Venkatesh & Bala, 2008).

H1: Perceived usefulness is statistically significant in influencing student e-learning satisfaction during covid-19 MCO period.

H2: Perceived ease of use is statistically significant in influencing student e-learning satisfaction during covid-19 MCO period.

H3: There is relationship between perceived usefulness and acceptance of institutional support.

H4: There is relationship between perceived ease of use and acceptance of institutional support.

Institutional Support

As more and more institutions of higher education turn to e-learning technologies in line with the growing Covid-19 cases nowadays, organizations have to realize their impact on the performance and acceptance of these technologies. There are numerous internal and external factors that contribute to online learning acceptance in an organization (Galletta et al., 1995; Igbaria et al., 1997). These literatures have demonstrated the impact of internal and external organizational support as factors on perceived ease of use and perceived usefulness. For this research, the facilitating condition and course content quality will be considered as elements of institutional support.

Facilitating condition

Facilitating condition is referred as individuals' perceptions of technical and organizational infrastructure, which is important in order to use and support a system (Paul et al, 2015). For instance, Mtebe and Raisamo (2014) conducted a study on 823 students from five higher learning institutions from East Africa on their behavioural intention to adopt and use mobile learning. They discovered that facilitating conditions had significant positive effects on students' mobile learning acceptance. This is in contrast with Muries and Masele (2017) study on 264 respondents from five universities in Tanzania, where it sought to understand the reasons that contribute to the continued usage of Electronic Learning Management Systems (ELMS). The result, the scholars found that facilitating conditions though positive, has no significant influence on ELMS continued usage intentions.

Information quality (Content quality)

Information quality (IQ) is one of the most important element and is essential in determining the success of e-learning in an organization (Alam et al, 2021). For e-learning to be successful, the quality of the information and its logical presentation must be prioritized. Past researches on electronic learning has proposed that information quality has a significant relationship between IQ and actual use, behavioral intention, perceived usefulness, perceived ease of use, and user satisfaction (Mohammadi, 2015; Ameen, 2020; Alam et al 2021).

H5: Institutional support is statistically significant in influencing student e-learning satisfaction during covid-19 MCO period.

H6: Institutional support mediates the relationship between perceived ease of use and student e-learning satisfaction.

H7: Institutional support mediates the relationship between perceived usefulness and student e-learning satisfaction.

Data and Methodology

Conceptual Framework

The principle for choosing the sampling framework for this research was to examine the factors that influence students' satisfaction on e-learning during the COVID-19 pandemic in

Malaysia. Technology Adoption Model (TAM) was adapted in this research to measure the variables because it was highly recommended by various researchers in their studies (Pilli, Fanaeian & Al-Momani, 2014; Mohammadi, 2015). Generally, TAM model employs 5 Likert scale for all the questions with end points where 1 refer to strongly disagree and 5 refer to strongly agree.

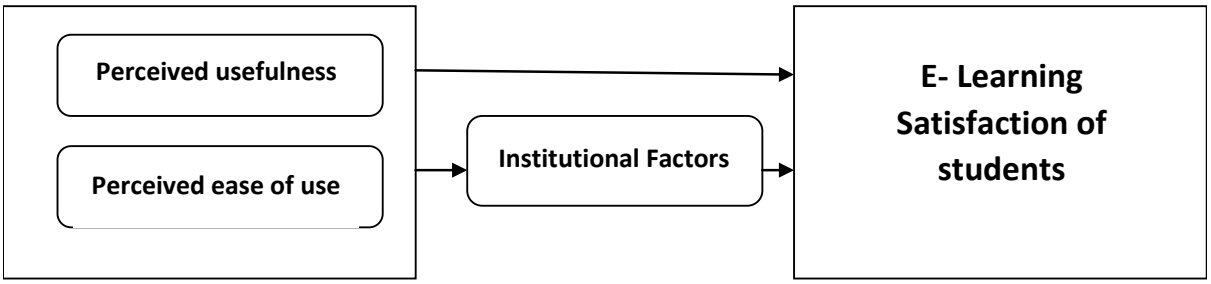

Figure 1: Path model for current e-Learning satisfaction

Research Method

In this quantitative research study, the targeted sample was students who study in private higher education institute, Malaysia. This research employs convenience sampling and cross-sectional survey questionnaires to collect the data. The questionnaire of the research covers varies areas; these including demographic characteristics, perceived ease of use, perceived usefulness, institutional support and satisfaction of the respondents towards their e-learning during Covid-19 pandemic period. The dependent variable in this research study refers to the e-learning satisfaction of the university's student. The student who achieve low satisfaction score indicates that they have the tendency of being unenthusiastic with e-learning, while respondents with high scoring of satisfaction we consider they being taker for e-learning. Alternatively, the independent variables for this research were perceived usefulness (Likert scale: 1 - strongly disagree to 5 - strongly agree), perceived ease of use (Likert scale: 1 - strongly disagree to 5 - strongly agree) and institutional support (Likert scale: 1 - strongly disagree to 5 - strongly agree). The survey manages to receive a total of 344 students with an age of 15 or above. Then, data collected was analyzed descriptively and inferentially using SPSS.

Results and Discussion

Socio demographic profile

From a total 500 questionnaires were distributed, 344 were estimated to be fit for advanced analysis. Out of 344 respondents, 49.1% were male and 50.9% were female's students. Majority of respondents (60.8%) lie in the age group of 15-19 years and 37.5% were from in the range of age of 20-24. Similarly, respondents of student in this study belonged to vary educational level and expertise background as displayed in table 1.

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

Description	Frequency	Total (%)
Gender		
Male	169	49.1
Female	175	50.9
Education Level		
Pre U/ Foundation	29	8.5
Diploma	253	73.5
Bachelor	62	18.0
Programme Enrolled (Major)		
Business Studies	103	29.9
Accounting and Finance	27	7.9
Information Computing Technology (ICT)	116	33.7
Chinese Language & Literature	17	4.9
Education	10	2.9
Guidance & Counselling psychology	5	1.5
Media Studies	15	4.4
Drama & Visual	6	1.7
Art & Design	45	13.1
Ages Group		
15-19	209	60.8
20-24	129	37.5
25 and above	6	1.7

Reliability and Validity Analysis

In this research study, information of demographic was collected through questionnaire first; UTAUT (institutional support), and TAM (perceived ease of use and perceived usefulness) were used to assess both external and internal variables that affected satisfaction of students on e-learning.To make sure the consistency of the questionnaire used in this research, it is necessary to test the reliabilityof the questionnaire. Table 2 show the result from the reliability test and the Cronbach's Alpha is more than 0.7. According to the rules of thumb in the study anticipated by Nunnally (1978), when Cronbach's alpha value is greater than 0.6, it is consider accepted. With the reliability analysis, it show that all 25 items scale contained in the questionnaire fulfil the internal consistency reliabilities, which all are greater than 0.60.

Table 2: Reliability Analysis

Variable	Cronbach's Alpha
Perceived ease of use	0.781
Perceived of usefulness	0.830
Institutional Supports	0.788
E-learning satisfaction	0.822

The Results of Multiple Regression Analysis

Table 3 shows the outcome of multiple regression analysis which involve independent variables (perceived ease of use and perceived usefulness) and mediating variable (acceptance of institutional supports). The regression analysis was performed to determine the influence of perceived ease of use and perceived usefulness on acceptance of institutional supports. The results show that the R^2 value is .427 and the F-value is 121.593 with significant .000. This indicates there is no auto-correlation. The results shows that relationship perceived usefulness is the main predictor of acceptance of institutional supports (β=.366, p<.01) followed by perceived ease of use (β=.198, p<.01). Therefore, hypothesis 3 and 4 are supported depicted in table 3 shows that perceived ease of use and perceived usefulness were all positively influence acceptance of institutional supports.

Table 3: Hypothesis Results

Hypothesis	Relationship	Std. Beta	Std. Error	t-value	Decision
H1	Perceived Usefulness→ E-learning satisfaction	0.598	0.05	12.41***	**Supported**
H2	Perceived Ease of Use→ E-learning satisfaction	0.185	0.04	4.50***	**Supported**
H3	Perceived Usefulness → Institutional support	0.366	0.04	8.71***	**Supported**
H4	Perceived Ease of Use → Institutional support	0.198	0.04	5.54***	**Supported**

The analysis of mediation in this study is involving two steps, this involve analysis without and with mediator as seen in Table 4. After introducing institutional support as mediator, all paths have a positive coefficient and significant. All criteria of mediation analyses criteria were completed. Based on those results, it can be concluded that institutional support is partially mediated between variables TAM and student's e-learning satisfactions. It means

that institutional support is regarded as mediator in relationship between Perceived ease of use / Perceived Usefulness and student's e-learning satisfactions.

Table 4: Results of Multiple Regression Analysis (Perceived ease of use, Perceived Usefulness, Institutional Support and Student Satisfaction)

	Dependent Variable Student Satisfactions		Remarks
	Without Mediator	**With Mediator**	
	Beta values	Beta values	
Constant	0.731	0.004	
Perceived ease of use	0.185***	0.093**	Partial Mediation Effect
Perceived Usefulness	0.598***	0.430***	Partial Mediation Effect
Institutional Supports		0.458***	
R	71.55%	76.85%	
R2	51.19%	59.2%	
Adjusted R2	50.85%	58.63%	
F-test (p-value)	178.8678 (<0.01)	163.00 (<0.01)	

** 5% confidence level, *** 1% confidence level

The results indicate that institutional support is established to significantly mediate the relationship between relationship perceived ease of use and student's e-learning satisfactions (β=.093, p<.05). It also shows relationship perceived usefulness has significant relationship with student's e-learning satisfactions (β=.430, p<0.01).

As shown in Table 4, though there has been a decrease in beta value of perceived ease of use from β=.185 to β=.0093 there is still a significant relationship between these two variables. Therefore, institutional support is a mediator for the relationship between perceived ease of use and student's e-learning satisfactions. Similarly, to perceived usefulness, the beta value decreases but is still considered as institutional support having a partial mediator relationship with perceived usefulness and student's e-learning satisfactions. The beta value of relationship perceived usefulness has decreased but is still significant. It can be summarised that institutional support has a partial mediation effect with student's e-learning satisfactions. Overall, institutional support has a significant relationship with student's e-learning satisfactions (β=.458, p<0.01). Therefore, H5, H6 and H7 were all supported.

The research findings support hypothesis H5 (There is a significant relationship between institutional support and student's e-learning satisfactions) which synchronize with study by Amoozegar, Daud, Mahmud and Jalil (2017), found consistency in finding a significant relationship between factor of institutional support and student's e-learning satisfactions.

From the analysis result, there has been a reduction in beta value in perceived ease of use, the research findings support hypothesis H6 (institutional support mediate the relationship between perceived ease of use and student's e-learning satisfactions). According to the outcome of study conducted by Al-Rahmi, Othman, Usman and Yusuf (2015), revealed a significant relationship between perceived ease of use and student's e-learning satisfactions. This means that most students of the university are not so confident and certain in handling particular technology that involve in e-learning process.

According to Leandro and Camila (2016) perceived usefulness is the main factor of students to accept the technological infrastructure and service support from educational institute. The characteristics of the support are critical to the level of satisfaction among student during the process of e-learning. Based on the results, the research findings support hypothesis H7 (institutional support mediate the relationship between perceived usefulness and e-learning satisfactions).

Conclusion and Recommendation

This aim of study was conducted to have a clear and better understanding of university student on their preference towards implementation of e-learning during this pandemic period by explaining the factors of perceived usefulness and perceived ease of use, institutional support and student's learning satisfaction. The results offer insights that perceived usefulness and perceived ease of use was found to be the predictors of acceptance of institutional support. However, relationship perceived usefulness was the most dominant factor in explaining acceptance of institutional support.

The study also found that institutional support as the mediator that affects the relationships of perceived usefulness and perceived ease of use. These findings create awareness to the existing body of knowledge on the significance of these factors in affecting acceptance of institutional support and e-learning satisfactions in the Higher Education Institution.

The results of the study indicate that it is important for institution to understand the needs and wants to satisfy their customers especially the university students. Focus should be given to institutional support in order to increase student satisfaction. Increasing student satisfaction will lead to better academic performance of students, at the same time it will pushes intention of student to use e-learning in future. Base on those results, this will also provide guidelines for institute to develop better systems operation of e-learning. Furthermore, management of universities in Malaysia should come out with better service quality in terms of institution support to increase students' satisfaction, and it pushes intention of student to use e-learning in future.

The present study has some limitations that could generate number of opportunities for future research. Firstly, future research directions could examine more antecedents that could influencing the e-learning satisfaction of students especially in develop countries. These variables could include the technology and quality offer by e-learning platform, cost to afford for e-learning, delivery method and many others.

Secondly, is recommended that future studies should focus on public universities in Malaysia with a parallel research track to this study. By doing so, researchers may discover whether the model also works into local universities with different background. The holistic results can be better achieved on e-leaning satisfaction once the researchers focus on the effect of extended Technology Acceptance Model (TAM).

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