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Students' Acceptance of Online Learning during Covid-19

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ABSTRACT

Objective - Universiti Tunku Abdul Rahman (UTAR) has implemented online learning methods during Covid-19. Students from the Faculty of Science, UTAR, face enormous challenges during this period as they need to attend all classes through a synchronous or asynchronous environment which is significantly different from their experiences within-person classes. Therefore, this aims to explore the level of acceptance of online learning among students from the Faculty of Science during the period that the movement control order was in place. Secondly, the study aims to determine the influence of perceived ease of use, perceived usefulness, and attitude toward online learning the students during the pandemic.

Methodology/Technique – A quantitative study approach is employed in this paper. Hence, the targeted population comprises final-year to-year students from the Faculty of Science, UTAR, with data collected through a convenient sampling approach with a minimum size of 150. The survey was distributed through MS Teams. The conceptual research model is developed based on a technology acceptance model (TAM). The model is analysed by Partial Least Squares Structural Equation Modelling.

Finding – The findings of this study have a significant impact on the level of acceptance of online learning among the Faculty of Science students. The study concludes that online learning systems and platforms are easy to use and indirectly benefit students' learning performance. In conclusion, learning attitude towards online learning, perceived ease of use, and perceived usefulness have a positive influence on the level of acceptance of online learning practices.

Novelty – This study addresses the concern of stakeholders for how online learning affects student satisfaction during the period that the movement control order was in place, with a particular focus on science-based subjects that required in-person practical tutorials in the lab.

Type of Paper: Empirical
JEL Classification: I21, I23
Keywords: Online Learning; Covid-19 Pandemic; Level of Student Acceptance; Partial Least Squares; Technology Acceptance Model

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1. Introduction

The education system across Malaysia has been affected as a result of the onset of Covid-19 in 2020. The Malaysian government has put in place the movement control order (MCO) to restrict the movement of the community in all states.

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Due to the pandemic, most higher education institutions in Malaysia, both public and private, have adopted online learning methods (Harun & Abd Aziz, 2021). In this regard, students have been required to adapt to the change from traditional learning methods to online learning (OL) methods (Abou El-Seoud et al., 2014) within a short period. OL in Malaysia is still rudimentary, and the acceptance of OL among students is critical to its success. Research has proven that OL is a practical alternative to in-person learning as the system provides flexibility with respect to the time and location of lessons, allowing students and lecturers to deliver or receive learning materials in a more flexible environment (Katz, 2000). As a result of this, students can gain a better understanding of the content of their classes by participating in OL activities such as interactive videos and pre-recorded videos (Gautam & Tiwari, 2016).

However, there are some challenges faced by both students and academic staff when dealing with OL methods. For instance, common technical issues such as poor Internet connection and low Internet speed may cause disruptions in the delivery of OL. (Landrum, 2020) emphasizes that a good facility can aid students' experience with OL and improve student satisfaction when using OL. In addition, students' attitudes towards OL will be affected by the perceived inconvenience of the environment in which they receive OL. For example, a noisy environment may cause difficulty for students and may therefore result in their rejection of OL methods. (Muhammad Sukri et. al, 2007) found that the acceptance of OL is low among students as they have fewer interactions with the lecturer and other students. (Kusuma, 2008) concludes that usability and ease of use are not critical factors to student acceptance of OL. These findings are inconsistent; this study aims to fill the gaps in past research.

University of Tunku Abdul Rahman (UTAR) is one of the private higher educational institutions in Malaysia, with two campuses located in Perak and Selangor, Malaysia. During April 2020, both academic staff and students encountered many challenges as UTAR transformed their mode of learning to OL. Students have faced significant challenges during the transition to OL. Students and academic staff experience high stress when transitioning lessons, discussions, assessments, and examinations to OL platforms with short notice (Bao, 2020). This transformation also becomes a challenge to those living in urban areas who are more likely to experience poor internet connection which impacts their studying progress. Although a lot of research related to OL has been conducted, a lack of attention has been paid to private university students in Malaysia. Thus, the level of acceptance among students in relation to this new learning environment is a critical issue worthy of further examination.

The objective of this study is to explore the level of student acceptance of online learning (AOL) in the Faculty of Science (FSC), UTAR during the period in which the movement control order (MCO) was in place. This study addresses the following research questions:

What is the acceptance level of OL among UTAR students from FSC?

What influence do Perceived Ease of Use (PEU), Perceived Usefulness (PU) and Attitude Toward Online Learning (ATOL) have on students at FSC during the pandemic?

This study was conducted during the Covid-19 pandemic. Despite this, under very limited conditions, we managed to survey 250 final year students from FSC, UTAR. As such, this study is one of the first to detail the factors that affect student satisfaction with OL. The findings of this study may provide a greater understanding of the acceptance level of OL among students at FSC, UTAR. In addition, the outcome of this study may assist the management of UTAR to make decisions regarding course design in the future. The rest of this paper is structured as follows: Section 2 discusses the literature review for this study. Section 3 describes the methodology, hypotheses, research design, and data collection. Section 4 discusses the findings followed by Section 5 which concludes the research, outlines its limitations, and makes recommendations for future research.

2. Literature Review

OL systems have been widely used in some undergraduate programs prior to the onset of the Covid-19 pandemic (Islam, 2016) (Lee et al., 2016). In recent years, the Covid-19 pandemic has made all educational institutions transform to OL platforms. Students can use OL platforms (such as zoom meetings, Google meet, and MS Teams) via their mobile phone, laptop, or tablet and they can play back recorded videos and submit their assignment through those platforms. The success of students in OL programs depends on many factors. (Zhang & Bhattacharyya, 2008) identified that the attitudes of students towards OL is expository to the success of OL. Understanding students' attitudes towards OL (ATOL) not only helps determine the students' feelings about their involvement in OL activities (Al-Musaw, 2014) but is also a practical tool to forecast OL outcomes (Cereijo, 2006). (Selim, 2007) studied the important factors to enhance the efficiency of OL, concluding that there are five critical factors: environment, instructional design, institutional management, service support, and course evaluation.

(Stecuła & Wolniak, 2022) investigated the benefits and disadvantages of OL during the pandemic in higher education in Poland. They found that a lack of direct interaction between lecturers and students and difficulties with teaching practical subjects were significant disadvantages of OL platforms. Meanwhile, (Al Rawashdeh et al., 2021) investigated the pros and cons of OL in higher education in United Arad Emirates prior to the onset of the pandemic. The study found that 81% of students agreed that scientific material can be presented in an interesting way through OL tools which may increase learning performance and motivation. However, 73% of students agreed that OL may result in social isolation.

Many studies apply the Technology Acceptance Model (TAM) model (Davis, 1989) to explain the perception of users in acceptance of technology by PEU and PU. According to TAM, the higher the PEU and PU, the higher the intention to continue using the program and the greater the acceptance of the Internet technology. (Taat & Francis, 2020) found that PEU plays an important role in students' AOL as it provides useful and timely information. They also found that OL can improve student learning performance and increase productivity. Based on research by (Farahat, 2012), ATOL is related to student AOL. Further, (Piccoli et al., 2001) found that tolerance, determination, self-motivation, technical proficiency, and passion are the five factors influencing student ATOL. Logically, implementing OL needs a stable and high-speed internet network. Thus, the results from the study of (Chung et al., 2020) show that internet speed in Malaysia needs to be improved; it is one of the main factors affecting the effectiveness of OL among undergraduate students.

Another study related to this research is (Azhar et al., 2021). They used the unified theory of acceptance and use of technology (UTAUT) model and found that user's achievement, technology support, and perceived value are the important factors in the success of OL. Additionally, behavioral intention in OL is also an important variable in the UTAUT model which has a positive influence on user behaviour (Alshehri et al., 2019) (Batoro, 2020) (Lin & Lai, 2019). (Venkatesh et al., 2012) extended the UTAUT model to UTAUT 2 model which includes three new variables: age, gender and experience. According to (Venkatesh et al., 2012), increasing a persons' age will affect their ability to use OL systems, meanwhile gender will have an impact on ATOL.

3. Research Methodology

3.1 Sample and Sampling Method

This study is based on a survey which aims to identify students' AOL in FSC, UTAR. The survey was conducted during the January trimester of the 2021 academic year through an online survey platform via a Google form and was distributed to the respondents using Microsoft Teams. This survey was carried out within a 3 months period (January 2021- March 2021). The study population consisted of all final year students from FSc, with data collected through a convenient sampling approach with a minimum size of 150.

Non-probability convenience sampling was used as it made it easier to collect the data during the MCO and is low cost (Hulland et al., 2018). The link for the survey was sent to the respondents via MS Teams. The participants were representatives of a variety of educational fields from 10 undergraduate programmes (Agricultural Science (AG), Biochemistry (BC), Biomedical Science (BM), Biotechnology (BT), Chemistry (CM), Dietetics (DT), Food Science (FS), Microbiology (MB), Statistical Computing and Operation Research (SC), and Logistics and International Shipping (LI)). In total, 250 bachelor students in their 3rd or 4th year (aged between 21-25 years old) who have experienced both in person (before the outbreak of the pandemic) and online classes (during the outbreak of the pandemic) took part in the survey. Of the 250 responses, 28 surveys were rejected due to incompleteness. Therefore, only 222 surveys were found to be relevant, representing 88.9% of the response rate; this fulfilled the requirement of accepted sample size.

3.2 Questionnaire Development

There are two sections in this survey: demographic data (Section A) and psychometric data (Section B). The demographic data includes items concerning gender, age, ethnic, programme of study, and current year of study. In Section B, the respondents are required to answer closed-ended questions based on their perception of OL. We developed the conceptual research model based on TAM. The variables of PU and PEU are based on the measures employed by (Davis, 1989) and (Salloum et al., 2019). The variable ATOL is measured based on research by (Liaw & Huang, 2003). On the other hand, the measure of AOL is obtained from (Song, 2010). Finally, the questionnaire contains 17 measurement items and 4 constructs, including PU (5 items), PEU (4 items), ATOL (4 items) and AOL (4 items). The factors are tested using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The validity of the survey was determined using Content Validity Indices (CVI) and Content Validity Ratio (CVR), which were 0.83 and 0.81 respectively. The Cronbach's alpha (CA) for the internal reliability of the pivot survey was 0.93.

3.3 Hypotheses

Having regard to the objectives of the study, the following hypotheses were developed:

H1: The PEU of students to use OL positively influences PU.
H2: The PEU of students to use OL positively influences ATOL.
H3: The PU of students to use OL positively influences ATOL.
H4: The PU of students to use OL positively influences AOL.
H5: The ATOL of students positively influences AOL.

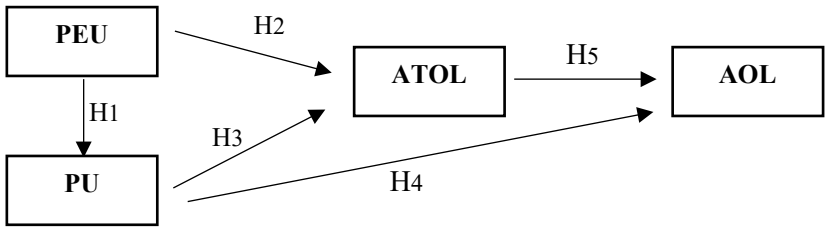

Figure 1. The Research Framework

3.4 Statistical Analysis

We analyzed the relationships of the proposed model using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS3.0. PLS-SEM. This is useful to evaluate empirical validation (Melchor

& Julián, 2008). (Ringle et al., 2012) states that the PLS-SEM is applicable for small sample analysis. The Composite Reliability (CR > 0.7) and CA ($\alpha > 0.6$) are used to determine the internal consistency of the indicators. We analyzed the relationships between the variables and their items to check the discriminant validity (DV) of each construct. Thus, Fornell-Lacker's Criterion (FLC) is used to assess the DV and to prevent multicollinearity issues among the latent variables. Average Variance Extracted (AVE > 0.5) is used to determine the convergent validity (CV) for all indicators on each construct.

Furthermore, standard path coefficients and t-statistics were used to measure the structural model. Bootstrapping confidence intervals are used to test the hypotheses of the model to prevent a biased significance test in PLS-SEM. The structural model was estimated using a bootstrapping method with 5,000 subsamples in this study. Then the T-test method is used to examine the hypotheses. Lastly, the effect size, f^2, is used to determine the strength of effect between the exogenous and endogenous latent variables. According to (Cohen, 1992), higher values indicate higher levels of the strength effect between the exogenous and endogenous latent variables. For example, $f^2 < 0.02$ is considered "weak effect", whereas values between 0.02 and 0.35 are considered "moderate effect". Values of f^2 above 0.35 are consider "strong effect".

4. Results and Discussion

4.1 Demographic Result

The respondents were 3rd or 4th year students at FSc in UTAR. A total of 250 surveys were sent out to the selected students through MS Teams and 88.9% of the responses fulfilled the requirement of the expected sample size. The sample revealed that 52.7% of the respondents in this study were female and 47.3% were male. Majority of the respondents were aged 22 (88.7%), followed by those aged between 23 and 25 (10.4%) and the remaining (0.9%) were aged 21. 94.1% of the respondents are Chinese students, followed by Indian (5%) and the remainder were Malays (0.9%). 93.2% of the students were in their 3rd year of study. Approximately 27.5% of the respondents are from LI, followed by FS (16.2%), DT (15.8%), BT (10.8%), CM (8.1%), MB (7.2%), SC (4.5%), BC (4.05%), AG (3.15%), and BM (2.7%).

4.2 Measurement Model

The results of convergent validity are presented in Table 1. The values of CA, CR and AVE are larger than the threshold values which satisfy the condition of the reliability of the measurement items. Table 2 provides the values of FLC and the results indicated that the survey had a very good DV. Table 3 shows the results of these hypotheses which were generated with 5,000 bootstrap samples at a 95% significant level. A t- test was used to determine the significance of the coefficient path between constructs. Since $t > 1.645$ for all the hypotheses, there is enough evidence to conclude that a relationship exists between the constructs' paths. PEU has direct and stronger effect on PU ($\beta = 0.851$) than ATOL ($\beta = 0.467$). The analysis shows that PU has positive and direct relationship to ATOL ($\beta = 0.413$) and AOL ($\beta = 0.469$). Relevantly, the results indicate that ATOL had a statistically significant and positive effect on AOL ($\beta = 0.465$). Finally, all exogenous latent variables have a strong effect on the endogenous latent variables, except H2 and H3 which indicate a moderate effect.

Table 1. Reliability Test Summary

Construct	CR (> 0.7)	CA (> 0.6)	AVE(> 0.5)
Perceived ease of use (PEU)	0.940	0.915	0.798
Perceived usefulness (PU)	0.940	0.914	0.797
Attitude toward online learning (ATOL)	0.906	0.862	0.744

Acceptance of online learning (AOL)	0.920	0.884	0.710

Table 2. Fornell-Lacker's Criterion

	PEU	PU	ATOL	AOL
PEU	0.893			
PU	0.851	0.892		
ATOL	0.817	0.811	0.843	
AOL	0.827	0.845	0.843	0.863

Table 3. The results of the structural model and effect size.

H	Path	Path Coefficient	T-Statistics	P-values	Result	f^2
H1	PEU → PU	0.851	25.726	<0.001	Supported	2.619
H2	PEU → ATOL	0.467	4.901	<0.001	Supported	0.208
H3	PU → ATOL	0.413	4.135	<0.001	Supported	0.107
H4	PU → AOL	0.469	5.369	<0.001	Supported	0.357
H5	ATOL → AOL	0.465	6.254	<0.001	Supported	0.345

4.3 Discussion

The main objective of this study was to identify the effects of perceived ease of use (PEU), perceived usefulness (PU), and attitude towards online learning (ATOL) on the acceptance of online learning (AOL). This study also examined the level of student acceptance of OL in FSc, UTAR. Our study shows that there is a positive association between PEU and PU among students. This finding is consistent with research by (Taat & Francis, 2020). Similarly, (Davis, 1989) and (Farahat, 2012) report that PU directly influences AOL through PEU. This indicates that if a student found that the OL system is not user-friendly, they would have a low level of acceptance of OL. Therefore, software developers need to focus on designing both useful and user-friendly systems for OL. In addition, the effect size between PEU and PU is strong in this study. During the outbreak of Covid-19, UTAR implemented OL systems and it became compulsory for all lecturers and students to use MS Teams as an OL tool. The students from FSC found that the MS Teams is easy to use and is useful. MS Teams is well developed by Microsoft, and it has the function of recording which enhances OL opportunities. With modern mobile technologies, students can study in a flexible manner and can revise lecture material by watching recorded videos at their leisure.

Our study shows that the attitude of students from FSC was positively affected by the PEU and PU. The results of other studies confirm this finding (Ku & Lohr, 2003) (Piccoli et al., 2001). Furthermore, these two factors also have the same moderate level of effect with the construct of ATOL. The moderate level of effect indicates that students may still accept OL systems although there is some inconvenience of online practical classes. Therefore, we conclude that students from FSC have a positive attitude towards OL as they found that the OL system is easy to use and convenient.

The results reveal that PU has a significantly positive effect on AOL. This finding is consistent with the findings of (Taat & Francis, 2020) and (Song, 2010). Additionally, students can practice self-directed learning through OL. In addition, they can easily access large amount of information, such as pre-recorded videos, live recorded videos during online lecture, presentation materials and e-books on the Internet, which assists them during assessments. According to the findings of this study, ATOL has a positive effect on AOL. This is consistent with the results of (Poon et al., 2004). According to (Poon et al., 2004), students in various universities have a moderate level of AOL. The findings of this study reflect that attitude and PU of FSC students directly influences their level of acceptance of OL. Moreover, the results demonstrate a strong effect

between them, which means the main factors that affect the acceptance level of OL are PU and ATOL. In the nutshell, FSC's students have a high level of acceptance as they can attend virtual classes flexibly, and the OL system enhances their learning performance. Furthermore, OL systems have a relatively low impact on students' learning experience, so they are more likely to accept it as an alternative to in person lessons.

5. Conclusion

In line with the objectives of this study, several conclusions can be drawn. Firstly, the five hypotheses are supported so we can conclude that students' attitudes toward online learning, perceived ease of use, and perceived usefulness have a positive influence on online learning performance. Secondly, students from FSC agree that the online learning system and the platform were easy to use and indirectly benefit their learning performance as they can watch the recorded video an unlimited number of times. The most preferred online learning method was a recorded lecture uploaded to MS Teams. Students also agree that they can easily search for information related to their subjects through the Internet and they are able to complete their assignments using the online learning platform which leads to a good attitude toward online learning. Overall, students from FSC in UTAR have a high level of acceptance of online learning. The acceptance level was positively affected by the perceived usefulness and attitude toward online learning. The students are getting to understand the values and opportunities to improve their learning performance by using online learning.

There are some limitations to be noted in this study. Firstly, this study only uses convenience sampling to collect data through MS Teams due to the MCO. Although this sampling method was the most suitable as it is easy to access and low cost, it has a bias probability. It is suggested to use probability sampling in data collection in future research to reduce sampling errors. Secondly, this study only focuses on students from FSc in UTAR so the results cannot be generalized. Future studies should investigate comparing online learning between students from different faculties and different geographical locations. Future studies could also investigate changes in academic performance as a result of online learning.

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