During the Covid-19 Pandemic, What Factors Influenced the Acceptance of Blended Learning in Malaysian Private Institutions?

Israa Najeeb Zaidan, Rabiah Eladwiah Abdul Rahim, Tabarek Najeeb Zaidan, & Ali Qusay Khalid

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ABSTRACT

Blended Learning (BL) courses integrate virtual and classroom learning experiences and allow efficient use of resources. Many studies have explored the adoption, acceptance, and use of e-learning in Malaysian private institutions. However, there is a lack of empirical studies on the acceptance of BL, and the use of e-learning in terms of behavioural intention and attitude within the Malaysian context and during the COVID-19 situation, which have forced institutions to conduct classes online. Filling this gap allows a significant contribution to be made, particularly during the COVID-19 pandemic and the practice of social distancing. The study aims to investigate the factors that influence the acceptance of BL in a private university in Malaysia. Analysis of current literature and Technology Acceptance Model, along with the Unified Theory of Acceptance and Use of Technology, were carried out to formulate the conceptual model of this study. The population of this study are students who have experienced and attended classes online during the COVID-19 situation. The findings indicate that perceived ease of use, social influence, and perceived usefulness have significant positive effects on attitude and behavioural intention.

Keywords: blended learning; technology acceptance; tam, covid-19 pandemic.

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ABSTRACT

Blended Learning (BL) courses integrate virtual and classroom learning experiences and allow efficient use of resources. Many studies have explored the adoption, acceptance, and use of e-learning in Malaysian private institutions. However, there is a lack of empirical studies on the acceptance of BL, and the use of e-learning in terms of behavioural intention and attitude within the Malaysian context and during the COVID-19 situation, which have forced institutions to conduct classes online. Filling this gap allows a significant contribution to be made, particularly during the COVID-19 pandemic and the practice of social distancing. The study aims to investigate the factors that influence the acceptance of BL in a private university in Malaysia. Analysis of current literature and Technology Acceptance Model, along with the Unified Theory of Acceptance and Use of Technology, were carried out to formulate the conceptual model of this study. The population of this study are students who have experienced and attended classes online during the COVID-19 situation. The findings indicate that perceived ease of use, social influence, and perceived usefulness have significant positive effects on attitude and behavioural intention. The attitude was found to have a significant positive impact on behavioural intention as well. A random sampling technique was used in this study, and the data was collected from 347 students, then analysed using Statistical Package for Social Science and AMOS software. Recommendations for decision-makers were addressed to ease the use of BL and show students its advantages and usefulness during and after the COVID-19 pandemic.

I. INTRODUCTION

The technology emergence of online learning has shifted the way that higher education institutions (HEI) share and deliver information to students. Various academic institutions are currently offering fully online courses and study programs [1]. However, this swift transformation in online learning has brought multiple challenges, uncertainness and difficulties. To this end, many academics find it challenging and are struggling to get involved with various platforms of online learning and to familiarise themselves to be able to utilize the technology in order to teach. It is difficult for educators to engage students in-depth through the offer of online lessons [2]. There is a lack of human contact during the course of learning, like sensing the incomprehension of students, adding facial expressions that are relevant to the subject known as "facial expressions" or "emotions", engaging of students and interaction. The lack of social contact and the lack of capacity to form study groups that students have traditionally enjoyed is another challenge that must be overcome [3]. However, online education technologies enable colleges and universities to offer opportunities for students who are unable to take classes on campus and to

students from other countries or regions to participate in academic sessions and activities [1].

The planet has been shaken by the Coronavirus Disease 2019 (COVID-19) pandemic, which started in Wuhan, China, and has immediately spread far and wide. COVID-19 has impacted over 190 nationalities, infected over 700,000 people, and killed over 30,000 people in just three months. Furthermore, the COVID-19 pandemic has caused unprecedented changes and impacted students, lecturers, and academic institutions critically [4]. Since then, many prestigious universities worldwide have completely utilized online learning practices, and social distancing approaches to ensure educational continuity and effectiveness [3]. In Malaysia, the Movement Control Order (MCO) which the government implemented, was activated on 18th March 2020, for two weeks until 31st March 2020, and then extended to 14th April 2020. The MCO was done with the aim of reducing the spread of COVID-19. All institutions of higher learning were in a state of shock for a few days, unsure how to deal with the abrupt transition. Before the MCO took effect on 17th March 2020, most students returned to their home countries and hometowns across Malaysia. Prior to the declaration on 16th March 2020, universities highly advised lecturers to use online educational technology tools to minimize the number of students gathered in large groups. Many faculty members got an introductory course in online teaching practices such as Google Classroom, Google Conference, Zoom from their colleagues. The Malaysian Ministry of Higher Education (MOHE) authorized all educational institutions to conduct online teaching or e-learning [5]. The Ministry also stated that online classrooms could only take place if all learners have access to lecturers and all necessary infrastructure. Following that, a new academic calendar was announced, and lecturers were advised to administer fully online classes starting on 14th April 2020 [3]. Leading MOHE announced that teaching and learning activities would be conducted online across all public and private universities in Malaysia until the end of December 2020 and extended until March 2021[6]. In overcoming the barriers faced by the

academic community due to the MCO, the academic community has shown its ability to stay involved, easy to adapt, and constructive. Everything, including lessons, initiatives, working groups, workshops, and evaluations, was arranged and began to be carried out with technology's assistance within two weeks.

There are a number of difficulties and uncertainties resulting from the rapid transformation of online learning and various online learning platforms that are being made available for academics to familiarise themselves with by completely embracing them. The conflict gets intensified, particularly when academics are required to teach online in a way that students are appropriately involved [2]. Online learning is overgrowing daily, and Blended Learning (BL) is one of the methods to incorporate this concept [7]. BL is currently an immensely essential and trending discussion topic among academics and students. Particularly during the current COVID-19 pandemic and the practice of social distancing, which has forced universities to reconsider their course delivery methods. A BL approach that incorporates traditional face-to-face teaching techniques and online classes have been adopted by many institutions [8]. The high degree of uncertainty on when the pandemic ends and when the "old normal" returns demands that students be educationally more effective; hence BL could be considered as the "new normal" where higher education have to make the difficult decision to stop physical classes without having to stop the learning process [2].

Widespread implementation of BL across HEIs has aroused great interest in the study of the acceptance of this innovative delivery method. Technology acceptance studies focus on the predictors of system adoption and use, with behavioural intention to use the system as a proxy for actual use. There are many reasons for technology acceptance, including technological and non-technological factors. Technological factors include system functionality, technological support, and security, while non-technological related factors are such as social, cultural, and trust. Many studies have explored the adoption, acceptance, and use of blended e-learning in

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Malaysia [9], [10], [19]–[21], [11]–[18]. However, there is a lack of empirical studies on BL in terms of behaviour intention and attitude in Malaysian private universities. The factors influencing the intention to use BL among private university students during this pandemic have yet to be investigated. This study will cover both technological and non-technological perspectives. Filling this gap and analysing the current status of BL adoption with identifying the relationships that influence the acceptance of BL allows a significant contribution to be made, particularly during the COVID-19 outbreak and social distancing situation.

The remainder of this paper is organized as the following. Section 2 explains the theoretical concept and choices behind this study, followed by Section 3, which reviews the related work, and Section 4 evaluates the research models and hypothesis. The research methodology is assessed in Section 5. The findings of the analysis are summarized in Section 6, followed by Section 7, where the results of the analysis are discussed. The implication of the findings is outlined in Section 8, and Section 9 concludes the article. Here, the study's shortcomings are discussed, and future directions for work are proposed.

II.   LITERATURE REVIEW

2.1 Blended Learning in Malaysia

Over the past few decades, in Malaysian higher educational institutions, the proper education sector has undergone major changes as it seeks to adjust to an ever-changing policy context that has enormously stressed the education field. From face-to-face instruction to distance learning, e-learning, online learning, and BL, the landscape for classroom instruction has shifted. Face-to-face education was the reality in the home nation for many decades, as instructors and learners gathered in a classroom. In many universities in Malaysia, online learning has gradually spread [22]. Since combined learning is a blend of face-to-face and web-based learning, the estimates differ from institution to institution. Many public universities are mainly face-to-face, such as UM, UKM, USM, and IIUM. In contrast,

some private educational institutions have much more educational technology lessons than face-to-face lessons. UniRazak is known as the country's first "virtual university". OUM was the first university to use BL methods with face-to-face teaching, Online tutoring, and the use of print modules in self-paced school teaching, which had established in 2000 [23]. Not only in Malaysia but also in Asia, web education along with open and distance education have evolved massively Jung et al. [24] identified approximately 70 providers in Asia for open and distance education.

A comprehensive study report on e-learning status, developments, and challenges in Malaysian HEIs recently identified the range of e-learning growth in Malaysia [22]. Over 10,000 participants from 30 HEIs (20 public and seven Private colleges and three polytechnics) comprising e-learning staff, lecturers and students participated in the survey. The study discovered that by the end of 2010, each institution involved had an LMS and an e-learning system for teachers, learners, and employees. Most institutions have a policy of e-learning and a dedicated e-learning system/centre/department. Half of the institutions had a dedicated e-content creation site/facility. Furthermore, almost half had e-learning Efficiency Guidelines. More than 50% of courses were offered online by eleven out of 30 institutions. However, just four institutions have incorporated their LMS with the information system for libraries.

According to Amin & Gerbic [22], many HEIs have also mentioned using OSS applications for their LMS, basically Moodle, because of its numerous features and functionality. In Malaysia, the privatisation of HEIs offered options for people to receive official certificates. However, the quality of private HEIs has been challenged because some of them are funded by political and business sources /organisations. According to MOHE [25], there are around 500 private HEIs (23 universities, 21 universities, more than 400 colleges, and five branches of universities abroad). MOHE has found it challenging to ensure that the "profit-driven" orientations of private HEIs did not jeopardise the standard of their education. As

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stated by Wilkinson & Yussof [26], private HEIs "are likely to be less concerned with improving the quality of education than public universities because their emphasis is on making money". Besides that, many private universities in Malaysia provide more online and blended education than face-to-face education to attract paper-based specialists.

2.2 Related Empirical Work of Blended Learning Acceptance

Many previous studies attempted to understand the factors that affect the adoption of technology, such as flipped learning, BL, and e-learning, as well as other technologies. In this section, a review and classification of the recent empirical studies and models regarding the BL are conducted to understand the findings of previous literature and to highlight the current research gaps. A total of 10 empirical studies related to BL were selected, reviewed, and analysed very carefully. After a thorough analysis, it was found that the current literature on BL is classified into three sections; (1) applications of BL, (2) theoretical frameworks of BL, and (3) influencing factors of BL. This research reviewed evolving research trends in BL studies within the past ten years. The literature reviewed many previous studies that attempted to understand the factors that affect the adoption of technology, such as

flipped learning, BL, and e-learning, as well as other technologies. A variety of blended e-learning applications such as Moodle, Blackboard, Canvas, Flipped Classroom, and Virtual Learning System (VLS) are among the applications that seem to offer benefits to students who seek to maximise their educational quality in an individualised or less structured environment. Also, various frameworks and models have been used to reveal the factors influencing the adoption of BL by academic staff and students, such as the TAM, the UTAUT model, the continuity model of information systems, the DE Lone and Mclean (D&M), the Innovation Diffusion Theory (IDT), and the theory of reasoned action. Numerous models have been suggested to measure the staff and students' behaviour and acceptance of BL in HEIs. Some focus on evaluating system characteristics through the BL system platform, others on satisfaction and usability of BL technologies. However, the 23 studies showed that there is a lack of empirical studies on BL and the use of e-learning in terms of behaviour intention and attitude in Malaysian private universities. Table 1 shows a summary of the articles, and it indicates the name of the author and year of publication, study description, method, theory, independent variables (IV), dependent variable (DV), and findings of the studies.

Table 1: Summary of selected articles.

Ref & Year	Study Description	Method	Theory	IV	DV	Findings
[27], 2018	The impacts or roles of usability variables were tested, and external support for the use of Moodle by outcomes of undergraduates in a blended learning environment.	Survey	Theory of reasoned action, technology acceptance model, and the information systems continuance model.	-Usability factors: (-Perceived ease of use -Perceived usefulness -satisfaction) -Teacher support -Peer support -Control variables: (Age, Gender , Year of study, Computer knowledge & Academic discipline (course))	-Use outcomes -Academic performance -Perceived learning assistance -Perceived impacts on learning	Usability variables have a significant effect on the outcome of use by students.
[28], 2018	The factors influencing the behavioural intentions of nurses to use the blended electronic learning system (BELS) have been investigated.	Questionnaire	Extended-TAM with the IS success model.	-Information Quality (IQ) -System quality (SQ) -Service quality (SVQ) -Perceived enjoyment	-Behavioural intention, -Attitude -Perceived Usefulness (U) -Perceived Ease of Use (EOU)	U and EOU are directly influenced by SQ, IQ SVQ

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[29], 2019	Explored and investigated the variables that affect how a student perceives the usefulness of an e-course in a BL environment.	Questionnaire	TAM and General Extended Technology Acceptance Model (GETAMEL)	-E-Teaching (ET) -Face-to-Face (F2F) -Technology Acceptance (TA)	-Perceived Usefulness (U)	ET has a positive impact on PU. TA positively affects e-teaching.
[30], 2020	The major factors affecting attitudes towards a blended e- learning system (BELS)were examined.	Questionnaire	TAM	-System Function -Computer Anxiety -Compatibility -System Response -Interactivity -Social Influence (SI)	-Self-Efficacy (SE) -Perceived Usefulness (U) -Perceived Ease of Use (EU) -Attitude Toward Using (AT)	Between System Function & SE significant positive correlation Direct significant positive effect on Self-Efficacy from Compatibility SE & AT have a significant positive correlation Compatibility & AT have a significant positive correlation Direct significant positive effect on U from SI
[31] , 2020	Identified key factors that impact the university's faculty to adopt blended learning	Interview	Grounded Theory	-Pedagogy fitness for Bl -Faculty technology affinity -Student positive disposition to BL -Institutional readiness	- Positive motivation to adopt BL -Motivating faculty to adopt BL	Technological affinity of faculty, student positive disposition to BL, institutional readiness and pedagogy fitness are positive motivational factors
[32] , 2019	The phases of adoption of the BL Methodology in HE settings were analysed and identified, and the assessment of the relationship between these phases and a set of factors relating to personal and qualified features, BL attributes	Survey	TAM	-Perceived Usefulness (U) -Perceived Ease of Use (EOU) -Facilitating Conditions (FC) -Self-efficacy (SE) -Anxiety (Anx) -Social Influence (SI)	-Behavioural intention	+Highly significant with All variables
[33], 2019	The relationship between (two components in TAM3), CSE and CA, with the attitude of Malaysian English as a Second Language Professors to integrate flipped learning was investigated.	Questionnaire	TAM3	-Computer Self-Efficacy (CSE) -Computer Anxiety (CA)	-Attitude	-Do not have any significant relationship from CSE and CA towards Malaysian ESL professors' attitude
[34], 2019	To examine the use of the Learning Manage ment System amongst students enrolled in an interactive, BL environment.	Questionnaire	DE Lone and Mclean (D&M) Model	-Computer Anxiety -Technology Experience -System Quality (SQ) -Information Quality -Service Quality -Course Quality (CQ) -Instructor Quality (IQ)	-Students' Satisfaction -Continuous Intention to Use	+ SQ, IQ, and CQ are important factors for the acceptance and satisfaction of learners.
[35], 2019	Examined the continuous intention of the teaching method of the learners Blended Learning Environment sponsored among college students by Company WeChat	Questionnaire	TAM and ECT	-Perceived usefulness (U) -Learner satisfaction (LS) -Confirmation	-Behaviour intention (BI)	+Positive factors of BI are PU and LS + Confirmation is a positive factor of PU and LS.
[36], 2020	Identified key factors affecting college students' embracing of the e-learning method in compulsory blended learning settings	Questionnaire	UTAUT& (D&M) Model	-System quality (SQ) -Information quality (IQ) -Social influence (SI) -Facilitating conditions (FC) Moderator variables: -Gender and major	-Use behaviour (UB) -Behavioural intention (BI)	+BI have significant positive effects from SQ, SI, and FC -No significant on BI from IQ -FC, BI, and use UB have No significant positive

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						relationship, and only moderator effect of gender exists.

As shown in Table 1, many studies have highlighted the integration of educational technology and a variety of BL applications; hence all studies related to this category were summarised in section (2.3) and titled as "applications of BL". The second part showed that different factors that were used to examine the BL, all studies related to this group are as discussed in section (2.4) under the sub-heading "influencing factors".

2.3 Applications of Blended Learning

Many studies have highlighted the integration of educational technology in classrooms [35], [37], [38]. A variety of blended e-learning applications in classrooms are difficult to fit with traditional paradigms; among the applications that seem to offer benefits to students who seek to maximise their educational quality in an individualised or less structured environment are Moodle, Blackboard, Canvas, Flipped Classroom, and VLS. Tselios et al [39] showed that the actual use of a platform by users is through the crucial driver of its usefulness through the investigation of acceptance of Moodle LCMS implementation in a degree program implementing the BL approach. As a Flipped Classroom LMS, Blackboard was studied by [40], who further explored the diverse factors that influence the adoption of BL from the client's perspective. Fathema et al [41] focused primarily on Canvas, a recently implemented LMS initiated in post-secondary schools to examine how faculty members' values and attitudes affect their intention and actual use of LMS in HEIs under scenarios of non-mandatory use of systems. Moreover, Fatimah & Rahman [33] studied flipped learning as a part of BL to understand user acceptance behaviour to assist decision-makers or Malaysian academic institutions to use or boost current flipped learning by fully understanding the primary indicators of client acceptance. The two variables, computer anxiety, and self-efficacy, are not the positive predictors when determining the attitude of the Malaysian ESL academics in adapting flipped learning, were the main findings of the author. Consequently, their findings encourage policymakers to boost education and schooling technology of ESL. In addition, [42] studied virtual learning system (VLS) as a part of BL instruction and argued that there is a direct relationship between all the precedents that lead users to continue using the system and their implications on learning efficiency and productivity and showed that satisfaction and fit are significant precepts for system and individual achievement.

2.4 Influencing Factors of Blended Learning Acceptance

Most early studies such as [28], [34], [36], [41], [43] focused on examining different factors such as the quality of (1) service, (2) system, (3) information, course, and instructor, and found that quality of service, instructor, and the course was among the essential variables for the acceptance and satisfaction of undergraduates. In another study [31], the researchers studied the approach that represented major aspects such as pedagogical fitness, affinity with faculty technology, student positive disposition to BL, and institutional readiness, which positively encourage teaching staff to endorse BL. Whilst, the study [44] found that the best predictors of the intention to adopt BL were the expectancy of effort and performance and hedonic motivation as well as proved no serious influence on habits and social influence. These findings contributed to explaining the factors influencing the intention to execute BL in a category that is not usually included in HE schooling. In contrast, the study [36] mentioned that Social Influence (SI) plays the most crucial role to affecting Behavioural Intention (BI). Also found that facilitating conditions have a significant positive influence on students' BI. There is no significant relationship between BI and students' usage behaviour.

Wu et al. [37] proposed the relationships among the dimensions of "job relevance", "output quality", "result demonstrability", "computer

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self-efficacy", "computer anxiety", "perceived usefulness", "perceived usefulness", "perceived ease of use" and "intention to use" and found each variable related positively with each other. Additionally, the study [45] explored how much variables such as "computer teaching efficacy", "school environment" and "computer attitudes" may have highly significant correlations with the acceptance of BL in education amongst Malaysian educators and reported that the data supported all the correlations and had direct effects on the use of BL. Another study [27] examined the impacts or positions of usability variables such as "satisfaction", "perceived ease of use" and "perceived usefulness" with external support such as "instructor" and "support peers" on Moodle's use outcomes for undergraduates in a BL setting. Moreover, the study [27] observed that the inherent students' motivation linked to usability factors had a good influence on their Moodle use outcomes in a BL scope.

Tsai et al. [28] examined the correlation between Perceived Enjoyment and the variables EOU and attitude. The researcher also added new additional variables to the TAM model constructed from the IS success model, which are "system quality", "service quality", and "information quality", which found that all significantly related except for the influence on PU was not positive from the quality of service. On the other hand, the study [30] discovered that several variables inferred from TAM theory toward Blended E-learning using LMS such as compatibility, perceived usefulness, computer anxiety, system function, social influence, system response, perceived EOU, perceived enjoyment, interactivity, AT, self-efficacy, and content feature.

However, to better understand the previous studies, a frequency analysis of the factors that were considered in previous studies was conducted. Table 2 shows the number of studies from 1 to 23, along with the variables considered in each study. The mark X refers to the variables or factors that were used in the study. The letter F refers to the frequency of the factor. In other words, the frequency is the times that the variables were used within the selected 23 empirical studies. For example, the variable self-efficacy was mentioned in two studies; in particular, the variable was mentioned in studies number 5 and 22. Similar procedures were conducted for all of the other variables.

The main purpose of performing this frequency analysis is to determine the most important factors that influence the acceptance of BL during the COVID-19 pandemic. Based on this review, the variables that were mentioned more than five times were selected. Table 2 showed that perceived usefulness, perceived ease of use, behavioural intention, attitude, and social influence were the most frequently used factors in the literature. Therefore, this study incorporated those factors in order to investigate the BL during COVID-19.

Table 2: Frequency (F) of the variables related to BL acceptance.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	F
Perceived Usefulness	X		X	X	X		X	X	X	X	X	X	X	X		X	X	14
Perceived Ease of Use	X	X	X	X	X		X	X	X	X	X			X		X		12
Behavioural Intention	X	X	X	X			X	X	X		X	X		X		X	X	12
Attitude	X		X		X		X	X	X	X						X		8
Social influence		X		X							X		X		X	X		6
Facilitating conditions	X			X							X		X		X			5
System quality	X							X				X		X	X			5
Computer anxiety				X	X							X		X		X		5
Student satisfaction		X	X									X		X			X	5
Information quality								X				X		X	X			4

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Factor																	Total
Performance expectancy		X									X		X				3
Effort expectancy		X									X		X				3
Computer self-efficacy				X	X									X			3
Service quality								X				X	X				3
Intention to use				X			X										2
Use Behaviour													X		X		2
Technology experience												X		X			2
Compatibility					X											X	2
Self-Efficacy			X													X	2
Continuance intention												X					2
Perceived playfulness							X										1
Hedonic motivation		X															1
Habit		X															1
E-Teaching																	1
Face-to-Face																	1
Technology Acceptance																	1
System Function																X	1
System Response																X	1
Interactivity																X	1
Impacts on learning																	1
Computer attitudes													X				1
Faculty technology affinity									X								1
School environment			X														1
institutional readiness									X								1
Perceived enjoyment			X														1
Pedagogy fitness for Bl														X			1
Computer teaching efficacy			X														1
student positive disposition to BL									X								1
Blended Learning use			X														1
Positive motivation to adopt BL									X								1
Motivating faculty to adopt BL			X														1
Relative advantage			X														1
Observability								X									1
Trialability								X									1
Complexity								X									1
Job relevance								X									1
Perceived Self Efficacy						X											1
Actual Use			X														1
Output Quality			X														1
Result Demonstrability						X											1
Behaviour and System Use						X											1
Perceived Satisfaction																X	1
Course quality											X						1
Teacher support																	1

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Peer support										X									1
perceived use outcomes										X									1
Perceived impacts on learning												X							1
Perceived learning assistance									X										1
Academic performance		X																	1
Anxiety									X										1
Instructor Quality		X																	1
Confirmation													X						1

III. THEORETICAL FRAMEWORK

3.1 Conceptual Model

The purpose of this research is to determine the attitude (ATT) and behavioural intentions (BI) of university students to use BL. The theoretical model for this study will therefore concentrate on the four major TAM variables: 1) perceived usefulness (PU), to determine the stage of an individual who believes that the use of a specific approach will help boost the performance of his or her; 2) perceived ease of use (PEOU), referred to as an individual who feels free to use a specific system effectively, both physically and mentally, with effortlessness; 3) attitude which refers to an optimistic or pessimistic individual's actions and 4) behavioural intentions refers to the individual's willingness to use BL [46]. Thus, this study uses the TAM model to explain the BIs of students to use BL in Malaysia.

A frequency analysis of the factors that were considered in previous studies from the summary of reviewed articles was conducted. The results show that the social influence (SI) was one of the most frequently used factors in the literature. In this research, social influence has adopted from the UTUAT theory. Where SI refers to the degree to which 'essential others' determine behaviour [47]. It involves colleagues, peers, and parents. Students are more likely to comply if these people support the use of technology. The TAM model does not include this variable which is critical for the adoption of new technology [47]. This study investigated many previous studies that attempted to understand the factors that affect the adoption of technology, social influence was one of the most frequently used factors in the literature. Hence, based on the literature review and the findings of the empirical works related to the theories of TAM and UTAUT, this study proposes that the factors PU and PEOU influence the AT and BI to use BL. The study also proposes that the SI influences the ATT and BI of BL. Accordingly, Figure 1 presents the conceptual model of this study.
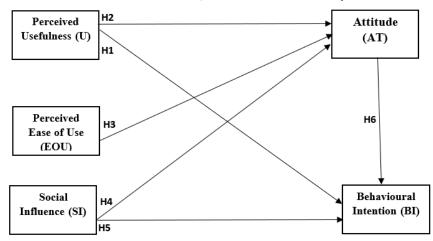

Figure 1: The proposed model.

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3.2 Hypotheses Development

3.2.1 Perceived Usefulness, Attitude and Behavioural Intention

The degree to which a method facilitates the achievement of work gains or employment results (in this case, learning). Therefore, the efficacy of BL can only be measured if students can use it to make or boost learning gains. If the use of BL results in students' learning success, it or else may be beneficial. Moreover, studies in the past have shown that U has a significant effect on attitude and behavioural intent [28], [39], [48]–[50]. Students would be easier to consider an e-learning framework if they think it will enable them to fulfil their academic objectives. The study then proposed the hypothesis below:

H1:   Perceived Usefulness of the student has a positive effect on student's Behavioural Intention to use Blended Learning.

H2:   Perceived Usefulness of the student has a positive effect on student's Attitude toward Blended Learning.

3.2.2 Attitude and Perceived Ease of Use

Perceived EOU reflects users' views about how much a specific device is required to achieve results [46]. However, in this situation, if students believe that BL is used with little effort, they would feel more relaxed and comfortable in using BL in a blended learning process. The better the ease of BL, the more beneficial it is [51]. The effect of the variable on technology adoption was studied in previous research. Perceived EOU has a significant impact on ATT [28], [39], [49], [50]. The study then hypothesises that:

H3:   Perceived Ease of Use of the student has a positive effect on student's Attitude toward Blended Learning.

3.2.3 Social Influence, Attitude and Behavioural Intention

The UTAUT construct is the SI, identified as the "degree to which a person perceives it important that others believe they should use a system" [47]. In the condition of BL, the degree to which peers feel they promote the use of BL is the social impact. According to Venkatesh et al. [47], SI is represented in other construct models, referring to behaviour alteration such as "subjective norms" in the theory of planned behaviour (TPB) and theory of reasoned action (TRA). Previous studies showed that SI has a significant impact on attitude and behavioural intention. The effect of SI on attitude was investigated in Pitchayakorn Lake [30] and showed a positive relation. Besides, Prasad et al. [52] identified that SI has a strong impact on BI. The following two hypotheses were therefore suggested:

H4:   Social Influence of the student has a positive effect on student's Attitude toward Blended Learning.

H5:   Social Influence of the student has a positive effect on student's Behavioural Intention to use Blended Learning.

3.2.4 Attitude and Behavioural Intention

Attitude is known as the positive or negative impression of a user about the performance of the target actions (e.g. using a system), that denotes an individual's optimistic or pessimistic behaviour [46]. Previous studies have observed a direct correlation between attitudes and BIs towards BL [28], [48], [49]. Consequently, the following hypothese suggested:

H6:   Attitude of the student toward Blended Learning has a positive effect on student's Behavioural Intention.

IV.   METHOD

4.1 Survey Design

The method of data collection is through a questionnaire which was adopted from other related studies from the acceptance and adoption domain. The survey comprises three sections. The first section is aimed at collecting the personal information of the participants, the second section is formulated to evaluate the BL experience, and the third section is developed to determine the influencing factors of BL acceptance during the COVID-19 pandemic.

The first section contains basic questions related to the personal information of the respondents, such as age, nationality, gender, education level,

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and living. In the second section, basic questions about the experience of BL related to the respondents were asked. Questions such as "Did you attend any online course since the COVID19 pandemic?", "What is the number of courses administered online?", "Are you willing to study online?", "What platforms did you use for the online learning?", and "What is your preferred online learning method?", were included in this section. In the third section, the questions are related to the variables of this study were asked. Namely, the questions related to perceived usefulness, social influence, perceived ease of use, attitude, and behavioural intention. All the

questions were evaluated utilising five scale points from Likert (Strongly disagree, Disagree, Neutral, Agree, and Strongly Agree).

As mentioned earlier, the questions or items were adopted from previous studies related to the adoption and acceptance domain. However, several items concerning COVID-19 and social distancing were newly added, and hence a pilot study was performed to assess the accuracy, validity, and reliability of these items. Table 3 shows the source of the measurements and questions, variables, and the number of items used.

Table 3: Sources of measurement.

Variable	Number of Items	Source
Perceived Ease of Use	5	[46] [53]
Perceived Usefulness	6	[46] [53]
Attitude Toward Using	6	[54][53]
Social influence	5	[47] [36]
Behavioural intention	5	[46] [49] [28]

4.2 Population

The study population is made up of students from Universtiti Tenaga Nasional (UNITEN). However, due to time, logistics and, additional costs, as well as the enforcement of the conditional movement control order (CMCO), which was implemented to reduce the spread of COVID-19, the population of this study is limited to one university. UNITEN has implemented the BL since 2016 [55]. Due to the current COVID19 situation, virtual learning has been introduced at UNITEN to cater to the needs of students and academics alike.

The population of this study consists of 3950 students. In this study, the sample will be selected from undergraduate and postgraduate students at various colleges of Campus Putrajaya. According to Krejcie & Morgan [56] and based on the sampling size table given in the work of [57], the sample size for a population of 3950 is 347 respondents. Uma Sekaran & Bougie [57] also pointed out that a sample size between 30 and 500 responses is sufficient for any academic

research. Hence, the sample size of 347 respondents is sufficient for this study.

4.3 Survey Distribution and Data Collection

An online survey was used to collect the data based on the students' existing information and their availability. The survey was conducted from October 2020 to March 2021 and was based on students who used the BL on the Putrajaya campus. A total of 840 questionnaires were sent to registered active students via email. Throughout the follow-ups, 360 email answers were received, with the response rate steadily increasing with each follow-up. Overall, 13 of the 360 questionnaires retrieved were blank or missing data, resulting in a sample of 347 valid surveys with a response rate of 43.5 percent. The demographics of the respondents are shown in Table 4.

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Table 4: Respondents' sample profile

Group	Frequency	Percentage
Gender		
Male	180	51.9
Female	167	48.1
Age		
Under 20 years	62	17.9
20 - 30 years	257	74.1
31 - 40 years	21	6.1
41 - 50 years	7	2.0
Nationality		
Local	240	69.2
International	107	30.8
Educational Level		
Diploma	9	2.6
Bachelor	306	88.2
Master	11	3.2
PhD	21	6.0
Living		
On-campus	37	10.7
Off-campus	310	89.3
Course Attending		
Yes	340	98.0
No	7	2.0
Course Number		
1 - 2	36	10.4
3 - 5	153	44.1
5 -7	114	32.9
Above 7	44	12.7
Study Online		
Yes	305	87.9
No	42	12.1

V. RESULTS

The research model proposed for this study was examined using structural equation modelling (SEM). In a similar approach, expert researchers (see [58], [59]) recommended a two-stage analytical technique, which was used in this study. It included a first-stage examination of the present measurement model and a second-stage review of the current structural models. The structural model defined the link between the constructs in the structural model, whereas the measurement model gave the measurements of the constructs [59]. This two-stage analytical method outperformed a single-step evaluation [60].

5.1 Descriptive Analysis

The number of returned samples was 347 valid responses. Among these, (51.9%) were males, and (48.1%) were females. Table 4 illustrates the frequency and the percentage of the demographical variables. The analysis showed that most of the respondents (74.1%) were between 20 to 30 years and the majority of the respondents (69.2%) were local. Furthermore, in

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terms of educational level, the results showed that (88.2%) have a Bachelor's Degree, and (89.3%) were living off-campus. In determining the participant's number of courses taken during the COVID-19 pandemic, 10.4% took 1 to 2 courses, 44.1% took 3 to 5 courses, 32.9% took 5 to 7 courses, and 12.7% took more than seven courses. In specifying an online study, 87.9% of the respondents stated they are studying online, while 12.1% stated they are not studying online. In determining the platform utilized, 20.2% of the participants claimed that they use Live video conferencing and chat (e.g., Zoom, Teams, WhatsApp, Telegram). In comparison, 1.4% used Guided discussion forums (e.g., Moodle, Email, Social Media, Google), and the majority of them, 78.4%, used both. Eventually, the respondents were asked to determine their method of learning.

As the results, 25.4% of the participants stated that they use Live video conferencing and chat (e.g., Zoom, Teams, WhatsApp, Telegram), 6.3% used Guided discussion forum (e.g., Moodle, Email, Social Media, Google), and the majority of them, 68.3% used both.

5.2 Assessment of the Measurement Model

The measurement model was analyzed by using the Structural Equation Modeling (SEM). In this study, 27 items were used to measure constructs. The survey, including all 27 items, is presented in Appendix A. Table 5 presented the result of evaluating the standardized loadings of the model's items which show the deleted items (below the cut-off of 0.5) and recalculated factor loadings for the rest of the items.

Table 5: Standardised initial factor loading of items.

Construct	Item	Initial Factor Loading	Item Deleted	Second Factor Loading
Perceived Ease of Use (EOU)	EOU1	0.813		0.813
	EOU2	0.774		0.774
	EOU3	0.764		0.764
	EOU4	0.737		0.737
	EOU5	0.712		0.712
Perceived Usefulness (U)	U1	0.768		0.767
	U2	0.774		0.774
	U3	0.161	Deleted	
	U4	0.74		0.743
	U5	0.743		0.745
	U6	0.755		0.753
Attitude (AT)	AT1	0.778		0.777
	AT2	0.769		0.769
	AT3	0.754		0.753
	AT4	0.802		0.802
	AT5	0.776		0.777
Social Influence (SI)	AT6	0.077	Deleted	
	SI1	0.814		0.814
	SI2	0.792		0.792
	SI3	0.726		0.726
	SI4	0.746		0.746
	SI5	0.745		0.745
Behavioural Intention (BI)	BI1	0.709		0.709
	BI2	0.782		0.782
	BI3	0.807		0.807
	BI4	0.799		0.799
	BI5	0.783		0.783

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The second iteration of the measurement model gave an inadequate fit of the data with the remaining 25 items. The Adjusted Goodness of Fit Index (AGFI) had dropped under the notch of 0.9, as suggested by AGFI advocates [61]. In this way, the model was enhanced by considering the modifications indices and standardised residual coefficient of each item. The model showed that some of the items provided high discrepancies between their related errors (M.I. of more than 15). Such discrepancies probably indicate that there are redundant items in the model. The high cross-item crosstabs M.I covariance values of the error of U6 with the items' errors of other constructs refer to between-constructional covariance. Such a condition exposes a critical cross-loading that took place in the model, which may lead to a lack of discriminatory validity. This item was removed from the model as opposed to representing it in relationship to the other items' errors [62]. The measurement model, together with the remaining 24 items, was performed again.

As shown in table 6, with all 24 remaining items, the overall model fit was adequate. Chi-square = 412.434, df = 241, p-value = 0.000 According to the results from the Goodness of fit (GOF), the chi-square is significant at 0.001 level. This law will not be applied if the size of the sample is more than 150 [63], [64]. The GFI was above the recommended level of 0.9. AGFI of 0.886 was above the cut-off point (0.80) as recommended by [61]. The result indicated a good fit of the model based on the collected data. The result is confirmed through the use of various indices, namely, TLI, IFI, and CFI. The result indicated the value for the indices is more than the cut-off value of 0.9. The indices values are 0.964, 0.958, and 0.964 for TLI, IFI, and CFI, respectively [65]–[68]. The root-mean-square error of approximation (RMSEA) was 0.045, which was below the threshold of 0.1, as recommended [69]. Additionally, the cut-off of df of 1.711 indicates that the model fits the data based on the result indicates that the model measurement is adequate and no further calibration or adjustments are needed [65].

Table 6: The Goodness of Fit Indices of measurement Models

Fit index	Modified Model	Recommended Values	Acceptable Values	Source
df	241			
CMIN (χ2)	412.434			
p-value	0.000	> 0.05	≥ 0.000	[63], [64]
χ2/df	1.711	≤ 3.00	≤ 5.00	[65]
GFI	0.908	≥ 0.90	≥ 0.80	[67], [70], [71]
AGFI	0.886	≥ 0.80	≥ 0.80	[61]
CFI	0.964	≥ 0.90	≥ 0.90	[65], [66]
TLI	0.958	≥ 0.90	≥ 0.90	[67], [68]
IFI	0.964	≥ 0.90	≥ 0.90	[67], [68]
RMSEA	0.045	0.05 to 0.08	≤ 0.10	[69]

The results of Cronbach's alpha and convergent validity analysis show that the factors loading range from 0.691 to 0.836, indicating that this has been exactly retained when indices are developed. Also show that there is a range from 0.567 to 0.603, the total amount of variance between all latent constructs. These characteristics were far above what Nunnally & Bernstein had envisioned (Nunnally & Bernstein, 1994). The composite reliability range of the instrument was from 0.847 to 0.883. All of these values exceeded the recommended value of 0.6 [65]. The Cronbach's Alpha exhibited a mean of 0.846 and a standard deviation of 0.883. All

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these values are greater than 0.7, as suggested by [72]. All constructs' reliability was deemed adequate.

The Discriminant validity is conducted to evaluate how the constructs of the survey are distinctive from other constructs. Table 7 shows that the correlations among the five constructs ranged from 0.402 to 0.777, 0.754, which were less than the recommended value of 0.85, as indicated by [71]. The results showed that there the connections were minimal than the square root of the AVE by the indexes, exhibited formidable discriminatory validity between these factors [71]. In the analysis of goodness of fit, discriminant and convergent, standardised variables were used to provide a standard of measurement for the constructs and their items.

Table 7: Discriminant validity for measurement models

Construct	EOU	U	AT	SI	BI
Perceived Ease of Use (EOU)	**0.761**				
Perceived Usefulness (U)	0.527	**0.762**			
Attitude (AT)	0.626	0.655	**0.776**		
Social Influence (SI)	0.402	0.483	0.577	**0.753**	
Behavioural Intention (BI)	0.613	0.624	0.754	0.632	**0.777**

Note: Diagonals represent the average variance square root extracted while the other entries represent the correlations.

5.3 Assessment of Structural Model

After passing the assessment of measurement model, the model can be interpreted by defining the relationships between the constructs. The assessment of the structural model concerns first about the overall model fit, then the calculation of the path coefficient and value of the hypothesis probability [67], [68]. Figure 2 shows the structural model's AMOS graph for the direct impact of constructs on their relationships.
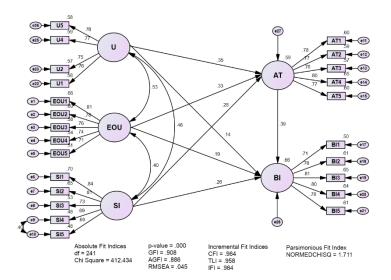

Figure 2: The structural model (AMOS graph).

The analysis of the goodness-of-fit index values clearly shows that the structural model matched the data adequately: $\chi2$ = 412.434, df = 241, p-value = 0000, GFI = 0.908, AGFI = 0.886, CFI = 0.964, TLI = 0.958, IFI = 0.964, RMSEA =0.045 and $\chi2/df$= 1.711.

The r - Squared value was 0.59 and 0.66 for attitude (AT) and behavioural intention (BI), respectively. For instance, this indicates the error disparity of BI is nearly 34% of the variance of BI itself. In other words, 66% of variations in BI are illustrated by its four predictors (U), (EOU), (SI),

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and (AT). Results showed that this study met the conditions for the cut-off [73]. The coefficient formula is used to check for a direct effect of the variables. These results are displayed in Table 4.

5.3.1 Hypothesis Testing

Based on the analysis results, Table 8 illustrates that all paths from (U), (EOU) and (SI) on (AT) and (BI), and a path from attitude (AT) on behavioural intention (BI), were statistically significant as their p-values were all below the standard significance level of 0.05. Thus, all hypotheses H1 to H6 were supported, as they are shown in Table 8.

Table 8: The evaluation result of hypothesised direct effects of the constructs.

Path	Unstandardized Estimate		Standardised Estimate	critical ration (c.r.)	P-value	Hypothesis Result
	Estimate	S.E.	Beta			
U → BI	0.146	0.065	0.141*	2.242	0.025	Supported
U → AT	0.371	0.069	0.347***	5.396	0.000	Supported
EOU → AT	0.31	0.055	0.333***	5.681	0.000	Supported
SI → AT	0.27	0.055	0.275***	4.926	0.000	Supported
SI → BI	0.249	0.054	0.262***	4.649	0.000	Supported
AT → BI	0.381	0.075	0.393***	5.095	0.000	Supported

*p< 0.05, **p< 0.01, ***p< 0.001

VI. DISCUSSION

To understand the factors that affect the student's attitude towards BL in a private university in Malaysia, we have examined a few hypotheses related to the phenomena and supported them theoretically by well-known models. For instance, the perceived usefulness significantly affects attitude and the findings showed this hypothesis was supported. Results are consistent with previous studies [74]. The perceived EOU has a significant impact on AT, results are consistent with previous studies [28], [39], [49], [50]. The hypothesis of social influence that has a positive effect on AT, the results are consistent with previous studies [30]. On the other hand, to examining the relationships between the factors that influence the behavioural intention towards BL, we hypothesized the influence of perceived usefulness on students' behavioural intention towards BL, which was supported in this study, and consistent with the findings from past studies [28], [39], [48]–[50]. Hence, U increased the intention of students to use BL and enabled them to do their study more efficiently, productivity, and enhance their learning performance. Overall, students who find BL

application tools and platforms are useful in their study preferred to be using the Internet to engage in online learning activities to practice social distancing during the COVID-19 situation. Moreover, we hypothesized the positive effect of social influence on behavioural intention and the results consistent with previous studies [52]. This finding shows that the social image of students among their classmates has a significant influence on their intention towards BL, and their self-image has an impact on BL. That is, technology might be viewed as a part of the standing of the students. This might explain the influence of the Information System on students' intention to study through the online mode. Finally, the attitude hypothesis which has a positive effect on behavioural intention. Also, previous studies have observed a direct correlation between attitudes and BIs towards BL [28], [48], [49].

Additionally, the findings indicated the most significant factors affecting BL adoption. The results indicated that attitude was one of the strongest predictors of behavioural intention and a strong predictor of attitude was perceived usefulness. After analysing all the variables in the literature, it was found that perceived ease of use,

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perceived usefulness, attitude, social influence, and behavioural intention were among the frequently used factors within the context of BL. The research has allowed for investigating students' acceptance of BL and, particularly, of the IT tools applied by the university in the process. It was found that students have a good feeling that BL has been enhancing their effectiveness, and productivity; students consider BL IT tools to be very intuitive, and they are generally comfortable with using computers and the internet; they plan to continue using BL in their courses and learning activities in the future.

VII. IMPLICATIONS

The students have a low to average impression that online learning has increased productivity and improved course efficiency and performance in two months (starting from 12 March 2020) [74]. However, BL platforms are considered very intuitive by students. They do not have issues with knowing the values of this educational method. They normally feel relaxed with computers and the Internet; BL is a positive thing, and they expect to use it often over the semester. This may also be caused by the fact that students have experience taking extra courses online via specific platforms (Moodle, Email, social media, Google chat, Zoom, Teams, WhatsApp, Telegram). Despite the views offered above on the general ease and utility of online education, students suggested they definitely wished to return to the conventional education, to the campus where they can talk with friends and to classrooms in which they can deal with different issues, offer and obtain knowledge from an individual and not from a computer. They felt uncertain about the notion of students who had to pass tests and assessments online and apply their work to the commission. Students started to assess all of the classes taught online at Universiti Tenaga Nasional (UNITEN), and precise and beneficial guidance on the topic of online classes is given, which will increase the consistency of online and classroom education. This study also can be helpful to the university's administration board in evaluating the effectiveness of BL usage because the implementation of BL tools might be costly and

affect an institution's educational policies. Moreover, the findings can contribute to university instructors adopting a more suitable approach for implementing BL tools in designing courses' instructions. The contribution of this study extends to the policymakers at universities who can gain deeper insights and understandings of the students' acceptance of BL technology, leading to a better developed BL policy.

VIII. CONCLUSION

This study examined the factors that affect the acceptance of BL at a private university in Malaysia during the COVID-19 pandemic. Analysis of current literature and related theories such as TAM along with other theories were carried out to formulate the conceptual model of this study. The study has proposed that the behavioural intention to use BL which shown to have a significant impact on the usage behaviour of blended learning by students, particularly during COVID-19 days. The population of this study was students who had gone through BL classes during the COVID-19 outbreak.

The population was limited to UNITEN. A random sampling technique was used in this research. Also, data were collected from 347 students and analysed via SPSS 26 and AMOS 20 software. The findings revealed that perceived usefulness, perceived ease of use, and social influence have significant positive impacts on attitude, and behavioural intention towards BL, especially during COVID-19 pandemic.

Furthermore, the positive impact of attitude on behavioural intention was demonstrated. Consequently, the study supported the full hypothesis of direct effect for all the research hypotheses. The results also revealed that attitude was the strongest predictor of behavioural intention. In comparison, the strongest predictor of attitude was perceived usefulness. The findings of this research were in line with the findings of previous empirical studies. The study introduces recommendations for decision-makers to ease the use of BL and educate the students about its benefits were discussed.

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Appendix A

All exogenous and endogenous variables together with their relative estimation errors.

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