

Research Article 02

The Study of Identifying the Factors Affecting Online Learning Acceptance among Postgraduate Students

W.W.D.P. Fernando¹, P. Lankeshwara²

^{1,2}Faculty of Management, Social Sciences and Humanities, General Sir John Kotelawala Defence University, Sri Lanka

¹ <https://orcid.org/0000-0002-4276-6122>

² <https://orcid.org/0000-0003-2221-2314>

Abstract

Online learning started to gain popularity across the world along with the outbreak of COVID-19 pandemic. Therefore, the objective of this study is to determine the variables that influence the acceptance of online education among postgraduate students. The study is based on the Technology Acceptance Model (TAM), which investigates the influence of variables such as perceived usefulness, perceived ease of use, social influence, and perceived quality of work on students' behavioral intentions towards online learning. A sample of 133 postgraduate students from a university in Sri Lanka was surveyed using a structured questionnaire. 62 respondents are following a degree program of Master of Science in Management (MSc) while 71 respondents are following a degree program of Master in Business Administration (MBA) and as a percentage, 46.6% is MSc and 53.1% is MBA. The collected data was then analyzed using statistical methods such as Pearson's chi-square test and binary logistic regression. The results indicate that the acceptance of online learning is significantly influenced by perceived usefulness, perceived ease of use, social influence, and perceived quality of work. The binary logistic regression model had an overall predictive accuracy of 82.7%, suggesting that these characteristics combined account for a substantial proportion of the variability in students' behavioral intentions to accept online learning. The study asserts that improving the ease of use, fostering peer support, and assuring cost-effectiveness are essential factors for enhancing the popularity of online learning among postgraduate students. The findings have significant importance for educational institutions aiming to enhance the utilization of online learning platforms, especially in light of continuous technological progress and evolving educational environments.

Keywords: Education technology, student engagement, teaching and learning environment

Introduction

The way information is delivered and accessible has changed because of the advancements in modern technology and due to some social issues affected globally. The increasing use of the Internet and technological advancements have increased the amount of online learning in comparison to traditional learning environments (Peechapol et al., 2018).

By utilizing technology to create a virtual classroom, online learning is an educational innovation that is changing traditional teaching and learning methods (Poondej & Lerdpornkulrat, 2019). Everyone in the world can easily and quickly access online learning resources removing distance barriers (Wongwuttawat, Jittima; Buraphadeja, Vasa; Tantontrakul, 2020). In addition to the mechanics of specific technologies used in such educational solutions, behavioral and social aspects also have a role in how successfully e-learning is implemented. These elements have been linked to users' adoption of technology, according to numerous studies (Nikou & Economides, 2017). The technology acceptance model (TAM), which is used in explaining users' adoption of technology, information systems research has frequently used how and why consumers accept and use a technological system (Marangunić & Granić, 2015).

Online learning became a prominent context due to the global pandemic, COVID- 19 and technology advancement in recent times. Therefore, studying behavioral intension on online learning helps to work with online learning effectively. The perception of the users as well as their computer knowledge and proficiency are key factors in the effectiveness of the adoption of e-learning technologies. It has been demonstrated that such significant aspects influence consumers' initial acceptance of computer technology and their future behavior towards the use of web-based learning systems (Kim & Moore, 2005). But, the majority of research tends to concentrate on the technical and pedagogical aspects of online learning, disregarding the impact of cultural and socioeconomic factors on acceptance (Rodrigues et al., 2019). Student engagement and satisfaction are significantly influenced by the capacity to collaborate with peers and maintain a social presence. But there are less researches on the social interaction aspect, which is vital for postgraduate students (Dennen, 2015). Therefore, this study tries to determine the variables that influence the acceptance of online education among postgraduate students using TAM which used to understand the technical as well as social factors on technology acceptance. Further, the study tries to check the association of explanatory variables in the TAM and the constructs of the explanatory variables with online learning acceptance and to identify the combined effect of independent variables on the dependent variable.

Literature Review

Technology Acceptance Model

The Technology Acceptance Model (TAM) is a prevalent theoretical framework that elucidates users' willingness to adopt information technology systems (Latief & Nur, 2019; Marikyan & Papagiannidis, 2023; Weerasinghe & Hindagolla, 2017). The Technology Acceptance Model (TAM), first introduced by Davis in 1989, centers on the adoption of novel technology by end-users, which is influenced by their perception of its value and simplicity of use (Akça & Özer, 2012). It was derived from two psychological theories regarding an individual's behavior and attitude. Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) are the two theories (Setyohadi et al., 2017). The purpose of TAM is to elucidate the factors that influence the acceptability of technology. TAM has demonstrated its effectiveness as a theoretical model for comprehending and elucidating the attitude of users toward the implementation of the information system, in accordance with its primary objective.

The most significant determinants of actual system use, according to TAM, are perceived efficacy and ease of use. External variables have an impact on these two variables. Social, cultural, and political factors are the primary external factors that are typically observed.

Language, abilities, and facilitating conditions are all social factors. The primary influence of technology on politics and political crises is political factors. The attitude to use pertains to the user's assessment of the feasibility of utilizing a specific information system application. The likelihood of an individual utilizing the application is quantified by behavioral intention (Surendran, 2012).

Behavioral Intention

Behavioral intention (BI) pertains to the probability that a user will engage in an intended behavior, which is a student's willingness to complete an e-learning task. Intention is a measure of an individual's willingness to exert effort in order to complete a mission or the amount of effort an individual would exert to execute an intended conduct (Ajzen, 1991). The TAM model has evolved into a reliable model that is suitable for predicting the adoption of a variety of technologies (Al-Busaidi, 2013; Al-Emran et al., 2018). Even though TAM was developed in the United States, it has been implemented and assessed in a variety of empirical studies and contexts (Al-Busaidi, 2013; Selvarajah et al., 2017; Tarhini et al., 2013). According to the TAM model, behavioral intentions to use in turn determine actual system use (Morris & Dillon, 1997).

Perceived Usefulness

Perceived usefulness is the extent to which the utilization of an application will enhance work performance within an organizational framework (Setyohadi et al., 2017). The construct perceived usefulness (PU) is defined as the extent to which students believe that utilizing an e-learning system will enhance their academic performance. This construct was developed as part of the technology acceptance model (Davis, 1989). The perceived usefulness of e-learning has been demonstrated to be beneficial in the provision of resourceful information at the appropriate time and location to support and enhance the university experience of students (Chen & Tseng, 2012). In turn, a system that is perceived as beneficial is one that a user believes has a positive use-performance relationship (Davis, 1989). In numerous studies, the efficacy of perceived usefulness has been recognized as a significant factor in influencing users' intentions to adopt a technology (Chen & Tseng, 2012; Davis, 1989; Renny et al., 2013; Venkatesh et al., 2003).

Perceived Ease of Use

Perceived ease of use (PEOU) is a measure of students' motivation and is determined by their evaluation of a critical aspect of technology, such as the interfaces and the processes involved in its use (Davis, 1989). Perceived ease of use is "the extent to which an individual believes that utilizing a specific system would be effortless." This is in accordance with the definition of "ease," which is "the absence of difficulty or significant effort." Effort is a finite resource that an individual can allocate to the various activities for which they are accountable (Sokolova et al., 2024). Several studies have demonstrated that the intention to use the system is directly and positively influenced by the perceived ease of use (PEOU) (Amoako-Gyampah, 2007; Chang & Tung, 2008; Koufaris, 2002). In contrast, Thomas Chesney, (2006) determined that the intention to utilize the system was not significantly and directly influenced by PEOU.

Social Influence

Social influence refers to the impact that others have on an individual's ideas and conduct (Mazman et al., 2009). Social influence (SI) is the degree to which students believe that their engagement in e-learning is driven by external variables such as their peers or instructors

(Vululleh, 2018). Research has demonstrated that social influence, originating from individuals' social circles, such as friends and family, as well as public environments, has a substantial effect on users' intentions to adopt new technologies (Cioc et al., 2023). Furthermore, within the field of education, it has been discovered that social influence mechanisms, such as subjective norms, have an impact on students' perception of the usefulness and their intention to embrace flipped learning classes. This emphasizes the significance of social elements in the acceptance of educational technology (Doo, 2023). Moreover, the impact of social media on the communication practices of public relations professionals is closely tied to the perceived simplicity and effectiveness of technology. This demonstrates how social influence impacts the behavior and practices of professionals in various industries (Igben & Ugbome, 2023).

Perceived Quality of Work

In order to enhance the technological acceptance Model (TAM), several studies incorporated the concept of quality of work (Tarhini, Hassouna, et al., 2015; Vululleh, 2018). This was done since the quality of work plays a significant role in the adoption of technology. Quality of Work (QW) refers to the degree to which students believe that utilizing e-learning would enhance their overall well-being, including reducing costs associated with accessing online courses, submitting assignments online, accessing e-library resources, and facilitating electronic contact between students and teachers (Vululleh, 2018). The inclusion of Quality of Work Life (QWL) in IS research was motivated by earlier empirical investigations, aiming to enhance and expand the TAM model (Kripanont, 2007; Tarhini, Hone, et al., 2015). QWL is determined by students' impression and conviction that utilizing technology will enhance their quality of work life, for example, by reducing costs when accessing e-journals or facilitating communication through email with instructors and friends (Tarhini et al., 2013).

Subsequently, this study attempts to determine the significantly associated variables for the technology acceptance of postgraduates in the Sri Lankan context.

Research Methodology

The study used a quantitative research technique to identify the factors affecting online learning acceptance among postgraduate students. The population consists of 210 postgraduate students enrolled in a specific university in Sri Lanka. The sample size was determined using Krejcie and Morgan Table. A sample of 133 students was chosen using the simple random sampling approach. The data were gathered using the structured questionnaire that consisted of items rated on a five-point Likert scale. The SPSS software was used as the research tool. Pearson's chi-square test is used to identify the categorical explanatory variables that have a significant association with the dependent variable. Further, this study has employed the "Binary Logistic Regression Model" as the primary analysis technique since the dependent variable carries two possible classifications as online learning accepters or online learning non-accepters.

Results and Interpretations

Pearson's χ^2 Test

Initially it is necessary to check the association of the explanatory variables with the dependent variable. Pearson's χ^2 Test is used to check the association among the categorical variables & the dependent variable. Explanatory variables in the TAM and the constructs of the explanatory variables were used to check the association with online learning acceptance.

Association between Behavioral Intention and Perceived Usefulness

The variable ‘Perceived Usefulness’ has four constructs namely perceived efficiency, perceived effectiveness, perceived ease and perceived productivity. The association was checked for all the constructs separately and perceived usefulness as a whole with the dependent variable. Accordingly, the following hypotheses were formed. To reject the null hypothesis, the significance value must be less than the significance level of 5%. ($P < 0.05$).

- H₀: There is not an association between Behavioral Intention and the corresponding explanatory variables.
- H_{1a}: There is an association between Behavioral Intention and Perceived Efficiency.
- H_{1b}: There is an association between Behavioral Intention and Perceived Effectiveness.
- H_{1c}: There is an association between Behavioral Intention and Perceived Ease.
- H_{1d}: There is an association between Behavioral Intention and Perceived Productivity.
- H₁: There is an association between Behavioral Intention and Perceived Usefulness.

Table 1: Results of the χ^2 Analysis – Perceived Usefulness

Hypothesis	Significance Value	Decision	Conclusion
H _{1a}	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Efficiency.
H _{1b}	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Effectiveness.
H _{1c}	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Ease.
H _{1d}	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Productivity.
H ₁	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Usefulness.

Source: Sample survey (2024)

The results revealed that all the constructs of perceived usefulness are significantly associated with behavioral intention. Further, the full variable, “perceived usefulness” also revealed to have a significant association with the dependent variable. This is further supported strongly by the significant all constructs.

Association between Behavioral Intention and Perceived Ease of Use

There are four constructs for the variable ‘Perceived Ease of Use’ namely perceived usability, perceived control, perceived clarity and perceived skillfulness. The association was checked for all the constructs separately and perceived ease of use with the dependent variable. Accordingly, the following hypotheses were formed with the previous H₀.

- H_{2a}: There is an association between Behavioral Intention and Perceived Usability.
- H_{2b}: There is an association between Behavioral Intention and Perceived Control.
- H_{2c}: There is an association between Behavioral Intention and Perceived Clarity.

H_{2d}: There is an association between Behavioral Intention and Perceived Skillfulness.

H₂: There is an association between Behavioral Intention and Perceived ease of Use.

Table 2: Results of the χ^2 Analysis – Perceived Ease of Use

Hypothesis	Significance Value	Decision	Conclusion
H _{2a}	0.205	H ₀ : Do not Reject	There is not an association between Behavioral intention and Perceived Usability.
H _{2b}	0.021	H ₀ : Do not Reject	There is not an association between Behavioral intention and Perceived Control.
H _{2c}	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Clarity.
H _{2d}	0.003	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Skillfulness.
H ₂	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Ease of Use.

Source: Sample survey (2024)

According to the results, there are no significant associations on the dependent variable from perceived usability and perceived control. But perceived clarity and perceived skillfulness have significant association separately with behavioral intention. When it comes to full variable, it is revealed that there is a significant association of perceived ease of use with the dependent variable.

Association between Behavioral Intention and Social Influence

In order to check the association between behavioral intention and social influence, first the chi-square test was performed for the four constructs namely instructor support, peer influence, institutional support and perceived compliance. Then the test was carried out to check the association between social influences collectively with the dependent variable. The following hypotheses were formed with the same H₀.

H_{3a}: There is an association between Behavioral Intention and Instructor Support.

H_{3b}: There is an association between Behavioral Intention and Peer Influence.

H_{3c}: There is an association between Behavioral Intention and Institutional Support.

H_{3d}: There is an association between Behavioral Intention and Compliance.

H₃: There is an association between Behavioral Intention and Social Influence.

Table 3: Results of the χ^2 Analysis – Social Influence

Hypothesis	Significance Value	Decision	Conclusion
H _{3a}	0.005	H ₀ : Do not Reject	There is not an association between Behavioral Intention and Instructor Support.
H _{3b}	0.023	H ₀ : Do not Reject	There is not an association between Behavioral intention and Peer Influence.
H _{3c}	0.001	H ₀ : Reject	There is an association between Behavioral Intention and Institutional Support.
H _{3d}	0.001	H ₀ : Reject	There is an association between Behavioral Intention and Compliance.
H ₃	0.001	H ₀ : Reject	There is an association between Behavioral Intention and Social Influence.

Source: Sample survey (2024)

Results revealed that the collective variable, social influence has a significant association with behavioral intention. In addition to that institutional support and compliance have significant association with the dependent variable individually.

Association between Behavioral Intention and Perceived Quality of Work

The variable ‘Perceived Quality of Work’ has four constructs namely perceived flexibility, perceived cost effectiveness, perceived engagement and perceived communication efficiency. The association was checked for all the constructs separately and perceived quality of work collectively with the support of all the significant constructs with the dependent variable.

H_{4a}: There is an association between Behavioral Intention and Perceived Flexibility.

H_{4b}: There is an association between Behavioral Intention and Perceived Cost Effectiveness.

H_{4c}: There is an association between Behavioral Intention and Perceived Engagement.

H_{4d}: There is an association between Behavioral Intention and Perceived Communication efficiency.

H₄: There is an association between Behavioral Intention and Perceived Quality of Work.

Table 4: Results from the χ^2 Analysis – Perceived Quality of Work

Hypothesis	Significance Value	Decision	Conclusion
H _{4a}	0.066	H ₀ : Do not Reject	There is not an association between Behavioral Intention and Perceived Flexibility.
H _{4b}	0.001	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Cost Effectiveness.

H _{4c}	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Engagement.
H _{4d}	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Communication Efficiency.
H ₄	0.000	H ₀ : Reject	There is an association between Behavioral Intention and Perceived Quality of Work.

Source: Sample survey (2024)

According to the results, there is not an association between behavioral intention and perceived flexibility. All other constructs and collective variables, perceived quality of work have significant associations with the dependent variable.

The findings of the study revealed that perceived efficiency, perceived effectiveness, perceived ease, perceived productivity, perceived usefulness, perceived clarity, perceived skillfulness, perceived ease of use, institutional support, perceived compliance, social influence, perceived cost effectiveness, perceived engagement, perceived communication efficiency and the total variable, perceived quality of work are significantly associated with behavioral intention.

Binary Logistics Regression Model

On the view of the above statistical analyses carried out separately for each variable, it has revealed that, except perceived usability, perceived clarity, instructor support, peer influence and perceived flexibility; all the other categorical variables have reported individual significant influence on the behavioral intention. Thus, in order to find the combined impact from the best set of independent variables out of all the significant variables, binary logistics regression was carried out under the forward Wald method. The results of the final model are shown in the following table. The significance of the Hosmer and Lemeshow test statistic concludes that the fitted model is significant at 5% level.

Table 5: Variables in the Equation

Variables	S.E	Wald	B	df	Sig.	Exp(B)
Perceived Efficiency	.047	1.071	.002	1	.965	1.048
Perceived Communication Efficiency	-.254	.778	.107	1	.744	.776
Perceived Effectiveness	.606	7.427	-1.652	1	.006	.192
Perceived Ease	2.384	5.397	5.539	1	.020	254.299
Perceived Productivity	1.243	.677	3.369	1	.066	3.466
Perceived Usability	-1.381	1.226	1.270	1	.260	.251
Perceived Control	.668	.809	.681	1	.409	1.951
Perceived Clarity	.464	.689	.454	1	.500	1.591
Perceived Skillfulness	.612	.770	.631	1	.427	1.843
Instructor Support	-1.573	.821	3.666	1	.056	.207
Peer Influence	.834	4.910	1.848	1	.027	6.344
Institutional Support	.323	.636	.258	1	.612	1.381
Compliance	2.314	.663	12.182	1	.000	10.112
Perceived Flexibility	-1.765	.845	4.368	1	.037	.171
Perceived Cost Effectiveness	1.836	.780	5.536	1	.019	6.271

Perceived Engagement	-.301	.687	.192	1	.661	.740
Constant	.202	93.316	-1.951	1	.000	.142

Source: Sample survey (2024)

Table 6: Classification of the Model

Observed		Predicted		
		Behavioral Intention		Percentage Correct
		Online learning non acceptors	Online learning acceptors	
Behavioral Intention	Online learning non acceptors	16	17	48.5
	Online learning acceptors	6	94	94.0
Overall Percentage				82.7

Source: Sample survey (2024)

The overall productivity power of the model is 82.7%. The probability of correctly classifying “non acceptors” given that not being screened is .485 against the probability of correctly classifying “acceptors” given that has been screened is .94.

The results in table 7 of the Cox & Snell R Square and Nagelkerke R Square indicate that the explained variation in the dependent variable based on the model varies from 26.7% to 39.6%. Both statistics indicate that the percentage of variance of dependent variable is explained by the model.

Table 7: Model Summary

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
107.793	.267	.396

Source: Sample survey (2024)

Final Model

Based on the results in table 5, the fitted model for the log odds ratio of online learning non-acceptors is given by the equation (1).

$$\text{Log} \left(\frac{p}{1-p} \right) = -1.951 + 5.539 * \text{Perceived Ease} + 1.848 * \text{Peer Influence} + 12.182 * \text{Compliance} + 0.171 * \text{Perceived Flexibility} + 5.536 * \text{Perceived Cost Effectiveness} - 1.652 * \text{Perceived Effectiveness} \dots\dots\dots (1)$$

Using equation (1), the model for odd ratio can be written as;

$$\left(\frac{p}{1-p}\right) = 0.142 + 254.299*\text{Perceived Ease} + 6.344*\text{Peer Influence} + 10.112*\text{Compliance} + 4.368*\text{Perceived Flexibility} + 6.271*\text{Perceived Cost Effectiveness} + 0.192*\text{Perceived Effectiveness} \dots\dots\dots (2)$$

The model (2) indicates that the variables perceived ease, peer influence, compliance, perceived flexibility, perceived cost effectiveness and perceived effectiveness are significantly influence positively on the odd ratio of not accepting online learning.

Based on the theory of logistic model, compared to a postgraduate who is not accepting online learning, the behavioral intention of a postgraduate has increased by 254.299 times when he is having perceived ease, increased by 6.344 times when he is having peer influence, increased by 10.112 times when the postgraduate comply with the online learning, increased by 4.368 times when he is having perceived flexibility, increased by 6.271 times if it is having perceived cost effectiveness and increased by 0.192 times when he is having perceived effectiveness.

Conclusion and Recommendation

The study reveals that the acceptance of online learning by postgraduate students is greatly influenced by various crucial characteristics, such as perceived ease of use, compliance, peer influence, perceived cost-effectiveness, and perceived effectiveness. Perceived ease of use and compliance were shown to be the most crucial factors influencing students' acceptance of online learning platforms. This suggests that students are more inclined to adopt platforms that are user-friendly and adhere to institutional norms. Furthermore, the significance of peer influence highlights the impact of social dynamics on developing students' attitudes towards online learning. When students view online learning as a financially efficient and advantageous method for improving their academic performance, their inclination to embrace these platforms rises dramatically.

These findings indicate that educational institutions should prioritize enhancing the user-friendliness of online learning systems, fostering a nurturing peer surroundings, and guaranteeing the cost-effectiveness of these platforms. Institutions can improve the overall acceptance and efficacy of online learning for postgraduate students by considering these aspects. The findings obtained from this study offer a significant structure for formulating tactics to enhance the acceptance of online learning, specifically in the context of advancing educational technologies and the continuous transition to digital learning environments.

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