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Learning Management System Usage among Undergraduates (Evidence from a Non-State University in Sri Lanka)

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Because the ultimate purpose of using a learning management system is to improve effective learning, the system's benefits cannot be realized if students use it infrequently. To determine the elements that affect student usage, education providers must first understand how students view technology and their concerns. As a result, educational institutions must identify the primary elements impacting students' use of LMS and why students decide to use or reject LMS when given the option. This study aims to determine the factors that influence the use of Learning Management Systems by undergraduates at a Sri Lankan non-state university. There are three theories about how people use E-learning. There are three of them: TRA, TPB, and TAM. Because TRA and TPB have some limitations, this study used TAM. This study was expanded based on earlier research to include the variables: Subjective Norms, Internet and Computer Experience, Self-Efficacy, Technical Support, and Anxiety. At the specified university, there are 2128 students. The researcher collected data from 141 students by using Stratified random sampling techniques. Then the data was entered into a SmartPLS3. All measurement criteria for the measurement model's reliability and validity were fulfilled, and the structural model has fulfilled the Goodness of Fit. The results show that Self-Efficacy and Anxiety have a significant negative impact on the Perceived Ease of Use. Perceived Ease of Use has a significant negative impact on the Perceived Usefulness

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Self-Efficacy and Technical Support have a significant positive impact on the Perceived Usefulness Subjective Norms, and Perceived Usefulness have a significant positive impact on Intention to Use.

Keywords: LMS, Undergraduates; Technology acceptance model (TAM); Sri Lanka; Non-State University.

1. INTRODUCTION

Today, employers' increasing desire for quick profit is colliding with many employees' deliberate pace of knowledge acquisition. Given that every company aspires to be a learning organization, the use of technology in the learning process is increasingly unavoidable. Organizations have made significant investments in information and communication technology in order to obtain or maintain a competitive advantage[1]. Many industry players are turning to online learning or electronic learning, which refers to the autonomous study of content provided on the Internet and subsequent testing of the acquired knowledge [2]. Electronic learning "eliminates temporal and geographical constraints, allowing for continued staff development in various learning venues, including homes, workplaces, and offsite conference rooms" [2]. Furthermore, e-learning solutions are a cost- and time-effective way to teach employees [3]. Not only do businesses see e-learning as a useful resource, but academic research also suggests that e-learning systems may be used to solve a variety of business challenges [4].

It is obvious that industry should not underestimate technology's potential. Some learners, such as disabled persons or employees, can benefit from this restricted form of education because of its rigidity [5], [6]. Despite the advantages of E-learning, there are several prerequisites for students to benefit from technology-based learning, particularly in underdeveloped countries [6-8]. It is also worth noting that the divide between industrialized and developing countries in terms of IT use is widening [7-12]. Developing countries, on the other hand, do not appear to have the capabilities or the will to employ Information Technology (TI) to develop operations in industries [7-11], [13-15].

Sri Lanka has a high level of literacy according to a well-established educational program, and it is ideally positioned to benefit from the rising global knowledge-based economy [16-22]. As a result, all public and private universities, as well as other higher institutions, have recognized the importance of creating skilled, competent, and well-educated professionals for Sri Lanka [18], [23], [19-22]. In Sri Lanka, information professionals anticipate information literacy to be a part of their life learning process, and learners in information management education have not yet achieved the needed level of information literacy competency [24]. There is still work to be done to improve university teaching with ICT technology, as the lack of adequate E-learning adoption is due to the lack of better technology in any university system [6], [19-22]. The findings of the observatory support also imply that e-learning has not yet realized its full potential and that E-learning providers are challenged in predicting the degree of acceptability of their E-learning program among potential consumers [6], [19-24].

An essential component in delivering e-Learning is the Learning Management System (LMS) [25], [26-28]. By contextualizing the learning experience, the LMS will also empower teachers to supervise better and control student achievement [25], [26-28]. Students can access course materials and class discussions at any time of day or night by logging into their courses. Students have access to course materials and a discussion forum where they can interact with lecturers and classmates. In their quest for knowledge, university students are eager to study new things, ideas, technologies, and information acquisition methods. Although E-learning platforms exist in Sri Lanka, most students do not use them efficiently or adequately [19-22].

Because the ultimate purpose of using a learning management system is to improve effective learning, the system's benefits cannot be realized if students use it infrequently. In order to determine the elements impacting student usage, education providers must first understand how students view technology and their concerns. As a result, educational institutions must identify the primary elements impacting students' use of LMS and why students decide to use or reject LMS

when given the option. This study aims to determine the factors that influence the use of Learning Management Systems by undergraduates at Sri Lankan non-state universities.

The following is how the paper moves. Section 2 discusses the literature review, Section 3 discusses the materials and methodologies, Section 4 discusses the estimated results, and the conclusion is presented in the final section.

2. LITERATURE REVIEW

Although a greater number of institutions that provide higher education use Web-based and E-learning courses, the ability of undergraduate students to embrace Web-based learning systems is rarely investigated [29], particularly in Sri Lanka. Students in developing nations behave differently than students in developed countries [11]. As a result, studies on e-learning adoption in developed nations cannot be used as a guide for developing countries [7], [8], [11], [13], [30-32]. A study from the perspective of a developing country is required to understand the factors of e-learning adoption [7], [8], [11], [13], [30-33].

Without prioritizing vital success variables in e-Learning, it is difficult to define the most important element affecting e-Learning success in developing nations [33], [34]. The Theory of Reasoned Action (TRA), The Theory of Planned Behaviour (TPB), and The Technology Acceptance Model (TAM) are three theories connected to E-learning usage. There are certain drawbacks to TRA and TPB [35-40], thus this study uses TAM.

2.1 The Technology Acceptance Model (TAM)

The goal of TAM's approach [41] was to determine the determinants for embracing computers as a whole and understanding user behavior among a broad spectrum of end-user computing technologies and users themselves while also being resourceful and theoretically justified [42]. One of TAM's main goals was to become the foundation for figuring out how external factors, as well as internal beliefs, attitudes, and intentions as far as the researcher was concerned, could find and trace the reasons why a particular system might be unacceptably flawed and, as a result, follow proper correction methods [42].

TAM adopts numerous distinct technical finds amidst diverse user groups beneath varied backgrounds such as word processors [42], spreadsheet programs [31], web browsers [43], e-mail [44], telemedicine [45], websites, on-line commerce [46], World Wide Web [47], [48], weblogs [49], the internet [48], 3G mobile the internet [50], and WebCT (WEB-based Course Tools) [29].

TAM eliminates the disadvantages mentioned in the TRA and TPB. TAM's popularity was demonstrated by the number of articles and introductory papers [41] and [42]. As a result, TAM has remained the most widely used theoretical model in the field of Information Systems [51]. Under TAM [35], [52-55], researchers looked into student acceptability of E-learning technologies.

More scholars have employed Subjective Norm [35], [53], [56-68], Experience in the internet & computer [35], [53], [69], [70], [57], [71], [61], [72-76] Self-Efficacy [35], [53], [58], [71], [61], [59], [55], [77], [78], [62], [74], [79-81], [76], Technical Support [35], [53], [29], [78], [81], [58], [82], [83], [84] and Anxiety [35], [77], [78], [69], [71], [61], [76], [85-86], as external variables of TAM. As a result, the current study is simply an extension of the TAM, with external factors affecting LMS usage for the testing model factored in. This study was expanded based on earlier research to include the variables: Subjective Norms, Internet and Computer Experience, Self-Efficacy, Technical Support, and Anxiety.

The social pressure to use or not utilize technology is the result of a shared understanding of what constitutes appropriate behavior (normative views) and a person's willingness to follow those values [42]. There is a significant impact, so it is once Subjective Norm's collaboration was incorporated into the new model to examine a link between behavioral intention and social influence [36], [42]. Subjective Norm has nothing to do with the intention to use a specific form of technology [42].

Certain factors influence people's intention to use computers, and researchers have discovered a significant difference in the relative influence of the determinants of usage based on experience. That experiences create a comfort zone that allows individuals to adopt technology [36]. It has been determined that when individuals have previous experience with it, they are more likely

to embrace it if it is discovered useful. In the context of E-learning adoption, one's computer experience influenced their behavioural intention to adopt E-learning [87].

Self-Efficacy determines a person's optimism and pessimism in self-improvement and self-debilitation [88], [89]. The optimistic or pessimistic mindset also influences an individual's ambitions and aspirations, the amount of effort they are willing to put in to achieve specific goals and how long they will retaliate in the face of setbacks and failure [89]. Individuals' outcome expectations were determined by efficacy beliefs, which determined whether the effort would result in favorable or negative results [88], [89]. Individuals retreat from tough jobs if they doubt their capacity in a particular area of activity. Their weak goals and commitments make it challenging to encourage them in comparable circumstances [88]. An individual who has a strong conviction in his talents, on the other hand, may see such tasks as challenges to overcome rather than risks to avoid because a strong feeling of efficacy improves the use of socio-cognitive in a specific domain [89].

The more excellent technological compatibility has an impact on the perceived benefits of technology adoption. Enhanced technology compatibility can be seen in the use of technology and the attainment of more extensive technical advantages, which result in reduced transfer costs, faster transfer times, and improved overall transfer of technology. As in the previous example, the firm may be able to reap the financial benefits sooner due to technology compatibility, which is analogous to greater competitiveness. The advantages of adopting a company's technology might be further boosted by the new technology's ease of adoption. [90], [78], [81].

Computer Anxiety is a word that describes a person's Anxiety of being forced to use computers [91]. Computer anxiety can cause users to have unfavourable feelings about their desire to adopt technology [78], [91]. Because computer anxiety has been demonstrated to have a large and negative impact on the intention to use an E-learning system, lecturers' computer competence should be improved through training. Overall, individuals who have had previous exposure to the use of technology should take advantage of it and use it to help those who have had no prior contact with educational institutions [69]. Individuals with lower levels of Anxiety appear to be more at ease using computers than those with higher levels of Anxiety.

2.2 Conceptual Model

The external factors impacting students' use of LMS were included in the external variables linked to the model, and they were expected to influence intentions of use through Perceived Ease of Use and Perceived Usefulness (see Fig. 1).

Perceived Ease of Use [53], [92], [57], [73], [74], [93] was thought to influence intentions of use when it came to experience in the internet and computers. Through Perceived Ease of Use, Self-Efficacy was thought to impact use intentions [53], [77], [81], [92], [62], [74], [80], [94]. Anxiety was considered to impact intentions of use through Perceived Ease of Use [92], [69], [79], [86] while Technical Support was assumed to influence intentions of use through Perceived Ease of Use [90], [53], [81], [79], [82], [83].

Perceived Usefulness was thought to impact intentions of use when it came to the experience internet and computers [53], [92], [57], [73], [93]. Through Perceived Usefulness, Self-Efficacy was thought to impact usage intentions [53], [77], [81], [92-95]. Anxiety was thought to impact intentions of use via Perceived Usefulness [92], [69], [79], [86], while Technical Support was expected to influence intentions of use via Perceived Usefulness [90], [53], [81], [79], [82], [83].

Subjective Norm was thought to directly influence use intentions [53], [65], [68], while Subjective Norm was thought to influence use intentions through Perceived Usefulness [60], [53], [56], [57], [62], [63], [65], [66], [67]. The perceived ease of use of a system influences its perceived usefulness [53], [56], [96], [97]. The Intention to Use is influenced by the Perceived Ease of Use [96], [97], [98], [99]. The Intention to Use was influenced by the perceived usefulness [53], [56], [96-99].

2.3 Definition of Dimensions

The defines of the dimensions used in the conceptual Framework are given in Table 1.

2.4 Hypotheses of the Study

This section provides a discussion on the hypotheses formulated for this study.

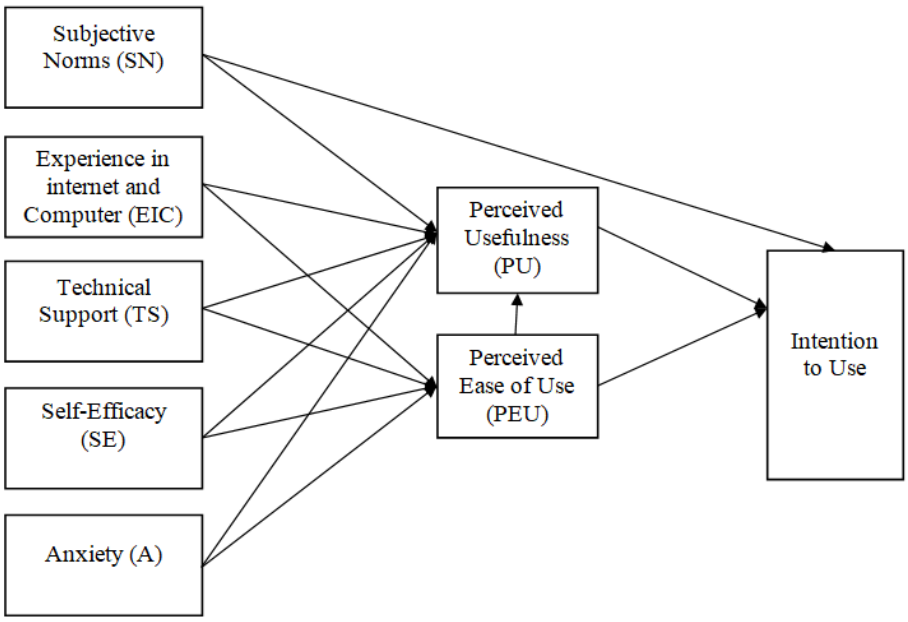

Fig. 1. Conceptual model

Table 1. The defines of the dimensions used in the conceptual Framework

Dimensions	Definition of the Researcher	Authors
Intention to Use	The subjective chances of one involved in a particular type of behavior	[100]
Perceived Ease of Use	The perception of a person as to what extent a specific system will be free from the effort when attempted	[101]
Perceived Usefulness	The extent to which a person believes that the system's utility will increase his or her delivery at work.	[101]
Subjective Norms	A person's perception of what people might impact their life would think about whether or not they should engage in a particular type of action in the issue.	[100]
Experience in computer and the internet	The length of time and frequency with which one utilizes the internet and computers, regardless of the reason.	[59]
Self-Efficacy	A person's idea is that he or she has the inner strength to complete a task, favor a task, maintain consistency, demonstrate keenness, and comprehend how strenuous the activity is.	[102]
Technical Support	The ability to easily approach technology resources and infrastructure.	[103]
Anxiety	When offered the opportunity to utilize computers, the amount of uneasiness or even dread.	[104]

3. MATERIALS AND METHODOLOGIES

The quantitative methodology is based on a deductive approach to the link between theory and research [107], in which hypotheses are derived from theories and tested empirically. This study's investigation began with formulating hypotheses, which were then followed by the collection of data, which either verified or refuted the theory. As such, this had often been a characteristic feature of quantitative research.

3.1 Population and Sample

The study aimed to identify the factors that influence the use of Learning Management

Systems by undergraduates at Sri Lankan non-state universities. At the specified university, there are 2128 students. According to the [108] sample size, 141 are the sample when the population is 2128, with 95%cofidence interval and 8% margin of error. Stratified random sampling was being applied to the groups from the population to derive a sample that contained homogenous characteristics among undergraduates of five faculties of the specified university.

3.2 Operationalization

As operationalization was one of the crucial components in implementing this research, the technique used to collect the research data was a questionnaire. This emphasizes the need felt for several careful steps under development and validation. Accordingly, the paradigm used for the construct measurement is given in Table 3.

Both Sinhala and English languages were used as the medium for the empirical study as them being the main languages spoken in Sri Lanka, and the original survey instrument developed in English was independently translated to Sinhala. This process was continued with the hard copy of the questionnaire and through the Google form. The coding process started with defining and labelling each variable. Coding all Likert scale questions, 5 for Strongly Agree and 1 for strongly disagree except PEU1, PEU2, PEU3, PEU4, PEU5, and EIC6. They were coded by 5 for Disagree strongly and 1 for Agree strongly. Then the data was entered into a SmartPLS3.

3.3 Data Analysis

First, explain the demographics of the responders. Then, using indicator reliability, reliability, and validity of measurement model, evaluate Measurement Model. After that, explain the structural model Goodness of Fit. Finally, test hypotheses in order to achieve the research objective.

Table 2. Hypotheses of the study

No	Hypotheses	Authors	
		Supported	**Not Supported**
H1	Perceived Ease of Use have an impact on the Perceived Usefulness	[52], [53], [56], [57], [96], [97],	[105]
H2	Perceived Usefulness have an impact on the Intention to Use	[47], [52], [53], [56], [92], [96], [97], [98], [99],	[105]
H3	Perceived Ease of Use have an impact on the Intention to Use	[47], [52], [53], [96], [97], [98], [99],	[92]
H4	Subjective Norms have an impact on the Perceived Usefulness	[60], [53], [57], [62], [63], [65], [66], [67]	[56], [64]
H5	Subjective Norms have an impact on the Intention to Use	[53], [65], [68]	[56], [57], [62], [66]
H6	Experience in the internet and computer has an impact on the Perceived Usefulness	[53], [92], [57], [73], [74], [93]	[75], [76], [96]
H7	Experience in the internet and computer has an impact on the Perceived Ease of Use	[53], [92], [57], [73], [74], [76], [93]	[75], [94]
H8	Self-Efficacy has an impact on the Perceived Usefulness	[53], [77], [81], [92], [74], [80], [95]	[62], [76]
H9	Self-Efficacy has an impact on the Perceived Ease of Use	[53], [77], [81], [92], [62], [74], [76], [80], [94]	
H10	Technical Support has an impact on the Perceived Usefulness	[90], [53], [81], [79], [82], [83]	
H11	Technical Support has an impact on the Perceived Ease of Use	[90], [53], [81], [79], [82], [83]	[84]
H12	Anxiety has an impact on the Perceived Usefulness	[92], [69], [79], [86]	[77], [76], [85]
H13	Anxiety has an impact on the Perceived Ease of Use	[92], [69], [79], [86]	[77], [106], [85]

Table 3. Operationalization of variables

Variable	Code	Items	Authors
Perceived Usefulness	PU1	The use of the LMS gives greater control over students' studies.	
	PU2	The use of the LMS improves students' performance in studies.	
	PU3	The LMS addresses the study-related needs of the studies.	
	PU4	The use of the LMS saves students time.	
	PU5	The use of the LMS allows students to get involved in the studies more than would be otherwise not possible.	[101]
	PU6	The use of the LMS enhances the effectiveness of studies of the students.	
	PU7	The use of the LMS improves the quality of the studies of the students.	
	PU8	The use of the LMS in studies of the students increases students' productivity.	
	PU9	The use of the LMS makes studies of the students easy.	
	PU10	Students find the LMS useful in their studies.	
Perceived Ease of Use	PEU1	Students often become confused when using the LMS.	
	PEU2	Students make frequent errors when using the LMS.	
	PEU3	Interacting with the LMS is often frustrating.	
	PEU4	Students need to consult the user manual often when using the LMS.	
	PEU5	Interacting with the LMS requires the mental effort of many students.	[101]
	PEU6	The LMS often behaves in unexpected ways.	
	PEU7	Students find it cumbersome to use the LMS.	
Intention to Use	ITU1	Students intending to use the LMS for study purposes.	
	ITU2	Students intend to increase students' use of the LMS in the future.	[53]
	ITU3	Having used the LMS, students would recommend it to their colleagues for study purposes.	
	ITU4	Students will return to LMS often.	
	ITU5	Students intending to use LMS frequently for students' course studies.	[52]
Technical Support	TS1	A hotline is available when there is a technical problem.	
	TS2	The new technology can be utilized for studies.	[53]
	TS3	The new technology is suitable for the studies.	
	TS4	The new technology is compatible with the studies of the students.	[90]
Experience in the internet and Computer	EIC1	Students spend many hours using the internet.	
	EIC2	Students frequently use the internet.	[53]
	EIC3	I have high expertise in internet activities.	

	EIC4	Students have high expertise in using a computer for learning.	
	EIC5	Students frequently use the ICTs (Information and communication technology) for learning.	
	EIC6	Students have problems in using it for learning.	[72]
Subjective Norms	SN1	Students' instructors think that students should use LMS.	
	SN2	People who are essential to students think that students should use LMS.	
	SN3	People who influence students' behavior think that students should use LMS.	[53]
	SN4	Students' close friends think that students should use the LMS.	
	SN5	Students' peers think that students should use the LMS.	[56]
	SN6	People whose opinions Students value prefer that students use the LMS in their studies.	
Self-Efficacy	SE1	Students are confident of using the LMS even if no one is to instruct them in the close vicinity.	
	SE2	Students are confident of using the LMS even if students have never used such a system before.	
	SE3	Students are confident of using the LMS as long as someone shows them how to do it.	[53]
	SE4	Students are confident of using the LMS if someone helps them.	
	SE5	Students are confident of using the LMS even before someone helps them to use it.	
	SE6	Students are confident of getting knowledge using the LMS even if Students had enough time to finish their studies.	
	SE7	Students are confident of using the LMS even if there was another kind of online help.	[77]
	SE8	Students are confident of using the LMS if someone showed students before.	
	SE9	Students are confident of using the LMS if students ever used it before.	
Anxiety	A1	Studying with a computer makes students nervous.	
	A2	Computers make students feel uneasy.	
	A3	Computers make students feel uncomfortable.	[77]
	A4	Computers scare students.	

4. RESULTS AND DISCUSSION

This section presents the data gathered and the results of statistical data analysis to address the research objectives.

4.1 Demographic Characteristics of Respondents

A summary of the analysis of demographic characteristics of research respondents is presented in Table 4.

4.2 Evaluation of Measurement Model

The loadings, reliability, and validity of the reflective measurement model about the latent variables are all evaluated. This entails determining the associations between the latent variables and the objects that they are linked to. The researcher took many approaches to minimize measurement error. The researcher must consider two crucial properties of a measure when assessing the degree of measurement error in any measure: reliability and validity [109].

4.3 Indicator Reliability

Path loadings in the outer (measurement) model give a set of criteria for evaluating the model's indication reliability.

Table 5 shows that all of the items' outer loading values are more than 0.7, with the exception of TS1, which has an outer loading value of 0.661. It is okay because it is close to 0.7 [109]. It means that the indicators' dependability is adequate [109].

4.4 Reliability

Cronbach's alpha was used to assess internal consistency. When Cronbach's alpha is more significant than 0.70, it is usually acknowledged that the results are reliable [109].

After removing EIC6, PEU6, and PEU7, Cronbach's alpha values of variables were greater than 0.70 (see Table 6). The researcher could then claim that all variables are trustworthy [109].

4.5 Validity

To determine the validity of the measures, two main valid criteria, namely content and construct, were assessed during the validation procedure of the research survey instruments. The subjective assessment of the metrics associated with the face validity for informal is known as content validity. Theoretically, all of the questions were evaluated and reviewed by researchers. As a result, content validity was ensured.

Measures are evaluated against each other rather than against an external standard in convergent and discriminant validity. Using composite reliability and AVE, conduct a convergent validity test.

Table 4. Demographic characteristics of research respondents

Variable	No. of Respondents	Percent (%)
Gender		
Male	56	39.7%
Female	85	60.3%
Faculty		
Management	35	24.8%
Information Technology	46	32.6%
Science	15	10.6%
Education	34	24.2%
Law	11	7.8%
Academic Year		
1st Year	22	15.6%
2nd Year	45	31.9%
3rd Year	54	38.3%
4th Year	20	14.2%

Table 5. Outer loadings

	A	EIC	ITU	PEU	PU	SE	SN	TS
A1	0.882							
A2	0.964							
A3	0.915							
A4	0.920							
EIC1		0.896						
EIC2		0.845						
EIC3		0.914						
EIC4		0.855						
EIC5		0.882						
ITU1			0.836					
ITU2			0.863					
ITU3			0.914					
ITU4			0.839					
ITU5			0.932					
PU1					0.915			
PU10					0.942			
PU2					0.923			
PU3					0.908			
PU4					0.932			
PU5					0.822			
PU6					0.906			
PU7					0.944			
PU8					0.911			
PU9					0.956			
RPEU1				0.873				
RPEU2				0.825				
RPEU3				0.905				
RPEU4				0.850				
RPEU5				0.775				
SE1						0.884		
SE2						0.851		
SE3						0.939		
SE4						0.924		
SE5						0.918		
SE6						0.934		
SE7						0.819		
SE8						0.877		
SE9						0.849		
SN1							0.854	
SN2							0.921	
SN3							0.902	
SN4							0.853	
SN5							0.904	
SN6							0.917	
TS1								0.661
TS2								0.931
TS3								0.942
TS4								0.952

In Table 7, composite reliability is greater than 0.7 [110], and AVE values are greater than 0.5 [111]. As a result, the researcher can confirm that the variables' convergent validity is adequate.

The Fornell-Larcker criterion is the standard approach for evaluating discriminant validity in variance-based structural equation modelling, such as partial least squares.

The square root of each AVE value corresponding to each latent construct is substantially larger than any correlation between any pair of latent constructs, as seen in Table 8. As a result, the researcher could confidently infer that this study's Fornell–Larcker discriminant validity criterion was valid [111]. Three criteria were used to evaluate the measurement model: indicator reliability, reliability, and validity. All measurement criteria for the measurement model's reliability and validity were fulfilled.

4.6 The Goodness of Fit for Structural Models

Only after measurement fit has been proven to be acceptable is structural fit examined. The factors and the arrows that connect one element to another make up the structural or inner model. The standardized regression coefficients are the loadings of the direct routes connecting factors. The conditions for a good model fit are described further down.

4.7 The standardized Root Means Square Residual (SRMR)

The SRMR is a measure of the researcher's model's approximate fit. When the SRMR is smaller than.08, a model is said to fit well [112].

Table 9 shows that the Saturated Model and Estimated Model SRMR values are both less than 0.08. As a result, the researcher can confirm that the model is a better fit [112].

Table 6. Reliability

Variable	Cronbach's Alpha
A	0.940
EIC	0.926
ITU	0.925
PEU	0.901
PU	0.979
SE	0.967
SN	0.949
TS	0.895

Table 7. Convergent validity

Variable	Composite Reliability	Average Variance Extracted (AVE)
PU	0.981	0.840
SE	0.971	0.791
SN	0.959	0.796
A	0.957	0.847
EIC	0.944	0.772
ITU	0.944	0.770
PEU	0.927	0.717
TS	0.931	0.774

Table 8. The Fornell–Larcker discriminant validity criterion

	A	EIC	ITU	PEU	PU	SE	SN	TS
A	0.921							
EIC	0.123	0.879						
ITU	0.144	0.793	0.878					
PEU	-0.268	-0.474	-0.532	0.847				
PU	0.135	0.749	0.788	-0.562	0.916			
SE	0.143	0.762	0.774	-0.487	0.745	0.889		
SN	0.163	0.811	0.825	-0.515	0.759	0.860	0.892	
TS	0.253	0.842	0.774	-0.443	0.755	0.672	0.737	0.880

4.8 The Coefficient of Determination (R^2)

The coefficient of determination (R^2) value is a commonly used metric for evaluating structural models.

The R squared value of the three models is shown in Table 10. Intention to use has an R-squared of 0.745. It means that independent variables can account for 74.5 % of the variation in Intention to Use. Perceived Ease of Use has an R-squared of 0.301. It indicates that independent variables may explain 30.1% in Perceived Ease of Use, while the R-squared for Perceived Usefulness is 0.713. It implies that independent variables can account for 71.3 % in Perceived Usefulness. The researcher can then claim that all models are adequate.

4.9 The Structural Model and Hypothesis Testing

The results of the structural model analysis are presented and discussed in this section. There are 13 hypotheses in the structural model.

Perceived Ease of Use has an impact on the Perceived Usefulness: In Table 11, the p-value is 0.011, and t statistic is 2.547. P-value is less than 0.05, and t statistic is greater than 1.97, indicating a significant coefficient. So, Perceived Ease of Use has a significant negative impact on Perceived Usefulness ($\beta = -0.202$). This indicated that the students, who Perceived a high level of Ease of Use of LMS, perceived the LMS was less useful. The finding was consistent with previous research [57], while [52], [53], [56], [97] identified that the Perceived Ease of Use has a significant positive impact on the Perceived Usefulness.

Table 9. The standardized root means square residual (SRMR)

	Saturated Model	Estimated Model
SRMR	0.065	0.066

Table 10. The coefficient of determination (R Squared)

	R Square	R Square Adjusted
ITU	0.745	0.740
PEU	0.301	0.281
PU	0.713	0.700

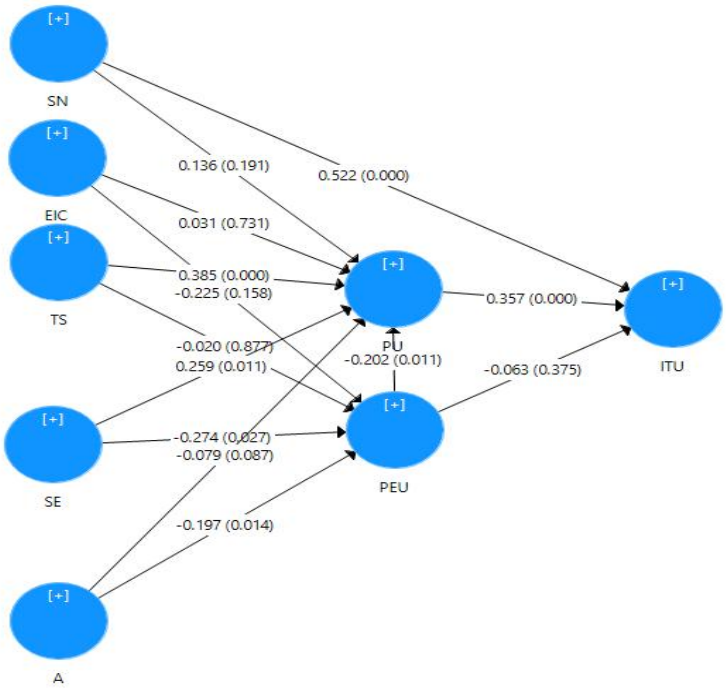

Fig. 2. Structural model with path coefficients

Table 11. Path Coefficient with Standard deviation, T-Statistic and P – Values

Hypothesis	Path Coefficient	Standard Deviation	T Statistics	P Values	Decision
Perceived Ease of Use has an impact on the Perceived Usefulness	-0.202	0.079	2.547	0.011	Supported
Perceived Usefulness has an impact on the Intention to Use	0.357	0.095	3.769	0.000	Supported
Perceived Ease of Use has an impact on the Intention to Use	-0.063	0.071	0.888	0.375	Not Supported
Subjective Norms have an impact on the Perceived Usefulness	0.136	0.104	1.311	0.191	Not Supported
Subjective Norms have an impact on the Intention to Use	0.522	0.099	5.295	0.000	Supported
Experience in the internet and computer has an impact on the Perceived Usefulness	0.031	0.092	0.344	0.731	Not Supported
Experience in the internet and computer has an impact on the Perceived Ease of Use	-0.225	0.159	1.415	0.158	Not Supported
Self-Efficacy has an impact on the Perceived Usefulness	0.259	0.101	2.550	0.011	Supported
Self-Efficacy has an impact on the Perceived Ease of Use	-0.274	0.123	2.224	0.027	Supported
Technical Support has an impact on the Perceived Usefulness	0.385	0.084	4.578	0.000	Supported
Technical Support has an impact on the Perceived Ease of Use	-0.020	0.130	0.155	0.877	Not Supported
Anxiety has an impact on the Perceived Usefulness	-0.079	0.046	1.714	0.087	Not Supported
Anxiety has an impact on the Perceived Ease of Use	-0.197	0.079	2.477	0.014	Supported

Perceived Usefulness has an impact on the Intention to Use: In Table 11, the p-value is 0.000, and the t statistic is 3.769. P-value is less than 0.05, and t statistic is greater than 1.97, indicating that the coefficient is significant. Perceived Usefulness has a significant positive impact on the Intention to Use ($\beta = 0.357$). This indicated that the students, who had Perceived Usefulness on LMS, had more Intention to Use LMS. The finding was consistent with previous researches [52], [53], [56], [92], [97], [98], [99].

Perceived Ease of Use has an impact on the Intention to Use: In Table 11, p-value is 0.375, and the t statistic is 0.888. P-value is greater than 0.05, and t statistic is less than 1.97, indicating that the coefficient is insignificant. So, there was not enough evidence to say that Perceived Ease of Use would impact the Intention to Use. The finding was consistent with [92] while [47], [52], [53], [96], [97], [98], [99] identified that the Perceived Ease of Use have an impact on Intention to Use.

Subjective Norms have an impact on the Perceived Usefulness: In Table 11, the p-value is 0.191, and t statistic is 1.311. P-value is greater than 0.05, and t statistic is less than 1.97, indicating that the coefficient is insignificant. So, there was not enough evidence to say that Subjective Norms have an impact on Perceived Usefulness. The finding was consistent with [56], [64] while [60], [53], [57], [62], [63], [65], [66], [67] identified that the Subjective Norms have an impact on the Perceived Usefulness.

Subjective Norms have an impact on the Intention to Use: In Table 11, the p value is 0.000, and t statistic is 5.295. P-value is less than 0.05, and t statistic is greater than 1.97, indicating a significant coefficient. So, Subjective Norms had a significant positive impact on Intention to Use ($\beta = 0.522$). This indicates that the students, who had a high level of Subjective Norms to use LMS, had more Intention to Use LMS. The finding was consistent with the previous researches [53], [65], [68].

Experience in the internet and computer has an impact on the Perceived Usefulness: In Table 11, p-value is 0.731, and t statistic is 0.344. P-value is greater than 0.05, and t statistic is less than 1.97, indicating that the coefficient is insignificant. So, there was not enough evidence to say that Experience in the internet and Computer has an impact on Perceived Usefulness. The finding was consistent with previous research [75], [76], [96] while [53], [92], [57], [73], [74], [93] identify that the Experience in the internet and Computer has an impact on the Perceived Usefulness

Experience in the internet and computer has an impact on the Perceived Ease of Use: In Table 11, p-value is 0.158, and t statistic is 1.415. P-value is greater than 0.05 and t statistic is less than 1.97, indicate that the coefficient is not significant. So, there is not enough evidence to say that Experience in the internet and Computer has an impact on the Perceived Ease of Use. The finding was consistent with previous research [75], [94] while [53], [92], [57], [73], [74], [76], [93] identify that the Experience in the internet and computer has an impact on the Perceived Ease of Use.

Self-Efficacy has an impact on the Perceived Usefulness: In Table 11, the p-value is 0.011, and t statistic is 2.550. P-value is less than 0.05, and t statistic is greater than 1.97, indicating a significant coefficient. Self-Efficacy has a significant positive impact on Perceived Usefulness ($\beta = 0.259$). This indicates that the students, who had a high level of Self-Efficacy to use LMS, perceived the LMS was more usefulness for them. The finding is consistent with previous research [53], [81], [92], [74], [80].

Self-Efficacy has an impact on the Perceived Ease of Use: In Table 11, the p-value is 0.027, and t statistic is 2.224. P-value is less than 0.05, and t statistic is greater than 1.97, indicating a significant coefficient. Self-Efficacy has a significant negative impact on the Perceived Ease of Use ($\beta = -0.274$). This indicates that the students, who had a high level of Self-Efficacy to use LMS, perceived the LMS as having less ease of use. But [53], [77], [81], [92], [62], [74], [76], [80], [94] identified that Self-Efficacy have a significant positive impact on the Perceived Ease of Use.

Technical Support has an impact on the Perceived Usefulness: In Table 11, the p value is 0.000, and t statistic is 4.578. P-value is less than 0.05, and t statistic is greater than 1.97, indicating a significant coefficient. Technical Support has a significant positive impact on Perceived Usefulness ($\beta = 0.385$). This indicates that the students, who had a high level of Technical Support to use LMS, perceived the LMS was more useful. The finding was consistent with previous research [90], [53], [81], [82], [83].

Technical Support has an impact on the Perceived Ease of Use: In Table 11, the p-value is 0.877, and t statistic is 0.155. P-value is more significant than 0.05, and t statistic is less than 1.97, indicating that the coefficient is not significant. So, there was not enough evidence to say that Technical Support impacts Perceived Ease of Use. The finding was consistent with previous research [84], while [90], [53], [81], [79], [82], [83] identified that Technical Support has an impact on the Perceived Ease of Use.

Anxiety has an impact on the Perceived Usefulness: In Table 11, the p-value is 0.087, and t statistic is 1.714. P-value is greater than 0.05, and t statistic is less than 1.97, indicating that the coefficient is not significant. So, there is no enough evidence to say that Anxiety has an impact on Perceived Usefulness. The finding was consistent with [77], [76], [85] while [92], [69], [79], [86] identified that the Anxiety has an impact on the Perceived Usefulness.

Anxiety has an impact on the Perceived Ease of Use: In Table 11, the p-value is 0.014, and t statistic is 2.477. P-value is less than 0.05, and t statistic is greater than 1.97, indicating a significant coefficient. Anxiety had a significant negative effect on the Perceived Ease of Use ($\beta = -0.197$). This indicated that the students, who had high level of Anxiety to use LMS, perceived the LMS was less ease of use. The finding was consistent with previous research [92], [69], [79], [86].

5. CONCLUSION

In the twenty-first century, most educational institutions have paved the way for students to improve their talents through the notion of student-centered learning. E-learning refers to any learning that is electronically enabled in the broadest sense and learning enabled by the application of digital technologies in a slightly narrower sense. Because the ultimate purpose of using a learning management system is to improve effective learning, the system's benefits cannot be realized if students use it infrequently. In order to determine the elements impacting student usage, education providers must first understand how students view technology and their concerns. As a result, educational institutions must identify the primary elements impacting students' use of LMS and the reasons for students' decisions to use or reject LMS when given the option. This study aims to determine the factors that influence the use of Learning Management Systems by undergraduates at Sri Lankan non-state universities.

There are three theories about how people use E-learning. There are three of them: TRA, TPB, and TAM. Because TRA and TPB have some limitations, TAM was chosen for this study. More scholars have employed Subjective Norm, Experience in the internet & computer, Self-Efficacy, Technical Support, and Anxiety as external variables of TAM. As a result, the current study is simply an extension of the TAM, with external factors affecting LMS usage for the testing model factored in. This study expanded the TAM based on a suggestion to include the variables: Subjective Norms, Internet and Computer Experience, Self-Efficacy, Technical Support, and Anxiety in previous research.

The results of the study reveals that, found that Perceived Ease of Use have a significant negative impact on the Perceived Usefulness, Perceived Usefulness have a significant positive impact on the Intention to Use, Subjective Norms had a significant positive impact on Intention to Use, Self-Efficacy have a significant positive impact on the Perceived Usefulness, Self-Efficacy have a significant negative impact on the Perceived Ease of Use, Technical Support has a significant positive impact on the Perceived Usefulness and Anxiety had a significant negative effect on the Perceived Ease of Use.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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