IJMS 2021 8(3): 43 - 60

International Journal of Multidisciplinary Studies (IJMS)
Volume 8, Issue 1II, 2021

Assessing E-Learning Satisfaction: University Teachers' Perspectives

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ABSTRACT

Online education has automatically acquired a prime position in the education system as a new paradigm in the context of the present COVID pandemic. The efficacy of online education is determined by user satisfaction, which eventually increases users' intentions to continue with online education. This study involves assessing University lecturers' satisfaction towards the e-learning system as a mode of lecturing. An online questionnaire survey was conducted using a convenience sampling technique and 200 questionnaires were distributed among academics in all National Universities in Sri Lanka. One hundred twenty-eight (128) responses were collected within one week (response rate about 64%). The analysis explored descriptive statistics and variance-based structural equation modelling in Smart PLS. The findings revealed that the satisfaction of academics for e-teaching activities is positive and above average in terms of perceived usefulness, confirmation, task technology fit, system quality, information quality, and training dimensions. Finally, 88% of respondents have agreed with blended teaching methods in the future while recommending strategies for integrating a considerable array of technologies' capabilities in higher education institutions. The paper contributes to existing knowledge by considering the majority of factors and their impact on e-learning satisfaction. Also, it deliberates the issues and challenges academics face about e-learning mode and their future blended teaching recommendations.

KEYWORDS: *E-learning satisfaction, blended-teaching, challenges in e-learning, university academic staff, COVID 19 pandemic*

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1 INTRODUCTION

E-learning has emerged as an innovative approach to deliver interactive learning in education, coinciding with Information and Communication Technology (ICT) growth. E-learning is typically acknowledged as all forms of educational technology in learning and teaching. It broadly discusses electronic learning, online teaching, distance learning, distance teaching, online education, virtual education, remote teaching, virtual learning, etc. (Simpson & Weiner 1989). E-learning is mainly defined in three different perspectives: learners' perspective, process perspective, and instructors' perspective (Bolliger & Wasilik 2009; Ahmed 2013). According to the current study purpose, e-learning is defined as "a type of distance learning that uses the internet technology to interact with remote learners and deliver educational material electronically to support students' and universities' goals and enhance knowledge transfer" (Ahmed 2013, p. 424).

E-learning does not confine education by place or time, which offers new possibilities for educational institutions to provide a cost-effective remote learning environment and flexibility of the internet as a delivery medium (Ahmed 2013). Also, this sort of education method is increasingly attractive among teachers and students due to easy access to journals, books, and studies of other materials on the internet; thus, classes can carry on virtual arrangement instead of being physically present (Al- Araibi, Mahrin, & Yusoff 2019). Accordingly, e-learning provides an alternative to conventional classroom education, allowing teachers to teach without restrictions. Al-Samarraie, Selim and Zaqout (2016) cited e-learning as a platform to accommodate interactivity and an active learning environment that stimulates collaboration and idea-sharing among students and instructors. Thus e-learning is performed as a promotion of the learning system while ensuring its smooth functioning and long term use, though in many developing countries, e-learning environment poses considerable challenges, i.e. internet connectivity issues, congested internet lines and internet traffic, lack of updated computer skills, less technological awareness and attitudes, etc. (Al- Araibi, Mahrin, & Yusoff 2019; Karunarathne *et al.* 2020)

E-learning is broadly embraced, and in the coming decades, it will be expected to become one of the most important resources for learning. Especially with the influence of the COVID-19 pandemic at the beginning of 2020, bringing all sorts of travel restrictions and compulsory health guidelines, eliminating the physical meetings with larger gatherings, e-learning was significantly acknowledged and carried out as online lecturing within many countries. Similar experiences were found in Sri Lankan universities due to the high risk of conducting face-to-face communication and gatherings at university premises; as usual, they too were transferred to the e-learning system (Karunarathne *et al.* 2020; Hayashi *et al.* 2020).

The available literature reveals that many studies have focused on the variety of e-learning aspects in terms of learners' perspectives, on learners' readiness,

satisfaction, intentions, issues and challenges, etc. (Watkins, Leigh & Tiner 2004; Liaw 2008; Shraim & Khlaif 2010; Karunarathne *et al.* 2020). However, some systems have already crashed due to various weaknesses related to institutions, technology, instructors' satisfaction, etc. Accordingly, it attested that little attention has been paid to the characteristics of teachers '/academic staff perceptions, willingness, satisfactions, motivations, issues and challenges regarding the e-learning system (Sorebo *et al.* 2009; Alhabeeb & Rowley 2018; Karunarathne *et al.* 2020). Conversely, identifying teachers' willingness to utilise a mode of e-learning system is essential because they perform as initiators, administrators, and facilitators of the e-learning system. Therefore, lack of willingness and motivation to use the e-learning mode could negatively affect the learners' outcomes and similarly cause underutilisation of valuable resources. Additionally, a clear understanding of academic staffs' perspectives is essential for the long-term viability and success of the e-learning system (Sorebo *et al.* 2009). Yet, current information verified that there is no evidence of research on this phenomenon since extensive e-learning is still in its infancy in Sri Lanka. Hence, this study aims to address the following research questions;

1. Is the academic staff satisfied with the e-learning system as a mode of lecturing?
2. What are the core/key factors that determine the university academic staff satisfaction with e-learning?
3. What are the issues and challenges faced by them with the e-learning mode?
4. Do academic staff recommend blended teaching in the future?

Consequently, this article contributes to the existing knowledge by studying e-learning satisfaction from the university academic staff perspective. Most of the existing research has adopted the school teachers' perspective and learners' perspective. Also, this article fills the gap in the Sri Lankan context since no evidence was found on this kind of study. Further, in current literature, scholarly works are found using a few variables at one time to see the effect on e-learning satisfaction. In contrast, the present study has considered many factors and their impact on e-learning satisfaction from university academics perspectives. Accordingly, the four objectives of the study are;

1. To assess the level of satisfaction of university academic staff on e-learning system as a mode of lecturing.
2. To identify the core/key factors that determine the university academic staff satisfaction on e-learning.
3. To identify issues and challenges faced by the university academic staff with e-learning mode.
4. To analyse the perception of the university academic staff on blended teaching in the future.

2 MATERIALS AND METHODS

2.1 Variables of the Study

Navigating through a wide range of literature, researchers have discussed different facts and constructs relating to instructors'/lecturers' satisfaction, intention to participate in e-learning, and adaptation to e-learning. (Chen & Tseng 2012; Ahmed 2013). For instance, Chen and Tseng (2012) investigated the variables such as the instructors' experience with computers, the instructors' experience with the internet, perceived complexity, and perceived usefulness with e-learning adoption. Besides, Ahmed (2013) examined the aspects like perceived usefulness, perceived complexity, perceived compatibility, perceived trail-ability, perceived visibility, experience with the internet, experience with computers, supportive university culture, and university size with the construct of instructor's intention to participate in an e-learning system. Sorebo *et al.* (2009) investigated the relationship between the following variables about teachers' motivation to continue using e-learning technology: perceived autonomy, perceived competence, perceived relatedness, perceived usefulness, confirmation, and intrinsic motivation satisfaction, and intention to continue. The present study investigates the relationships between perceived usefulness, confirmation, timely response and attitude, task technology fit, system quality, information quality, social influence, level of student participation and interaction, and training programs with lecturers' satisfaction towards using the e-learning system (Table 01).

Table 01: Description of Variables

Variable	Definition	Sources of Literature
Perceived Usefulness	Lecturers' perception of the degree of improvement of learning due to the adaptation of e-learning system.	Pituch & Lee (2006) Sun *et al.* (2008) Sorebo *et al.* (2009)
Confirmation	Realisation of the expected benefits using e-learning technology	Bhattacherjeee (2001) Sorebo *et al.* (2009)
Attitude and Timely Response	Person's cumulative assessment of a service offering.	Sun *et al.* (2008) Liao, Palvia, & Chen (2009)
Task–Technology Fit	The degree to which technology assists a person in conducting their tasks and needs	Sun *et al.* (2008) Gu & Wang (2015)
System Quality	The well-designed structure, procedures, and processes for implementing an e-learning system	Delone & McLean (2003) Al- Samarraie, Selim & Zaqout (2016)
Information Quality	A metric that tests semantic success, such as the precision, timeliness, completeness,	Ghasemaghaei & Hassanein (2015)

	significance, and clarity of data generated by an information system	
Social Influence	The degree to which a person believes significant that others think he or she can use technology	Chiu & Wang (2008)
Student participation & interaction	Willingness, need, desire, and compulsion of students to engage in and succeed in the e-learning process	Bomia *et al.* (1997) Gray & DiLoreto (2016)
Training program	Different methods which are essential to instructors for engaging new technologies in their teaching process	Khasawneh & Yaseen (2017)

Source: Literature Survey

The analysis of the study is guided by the conceptual framework (Figure 01). It conceptualises that each of the factors has a positive relationship with lecturer satisfaction. Therefore, lecturers' positive responses to each of those dimensions cumulatively affect the e-learning system. Accordingly, the following hypotheses are developed.

H1: Lecturers' level of perceived usefulness of e-learning system positively affects satisfaction towards using the e-learning system.

H2: Lecturers' level of confirmation of e-learning system positively affects satisfaction towards using the e-learning system.

H3: University academic staff's positive attitude toward e-Learning and timely response to students' issues in e-learning positively affect satisfaction towards using the e-learning system.

H4: Task–technology fit positively affects satisfaction towards using the e-learning system.

H5: Well operational system (system quality) positively affects satisfaction towards using the e-learning system.

H6: Information quality positively affects satisfaction towards using the e-learning system.

H7: Social influence positively affects satisfaction towards using the e-learning system.

H8: Level of student participation and interaction positively affect satisfaction towards using the e-learning system.

H9: Training programs positively affect satisfaction towards using the e-learning system.

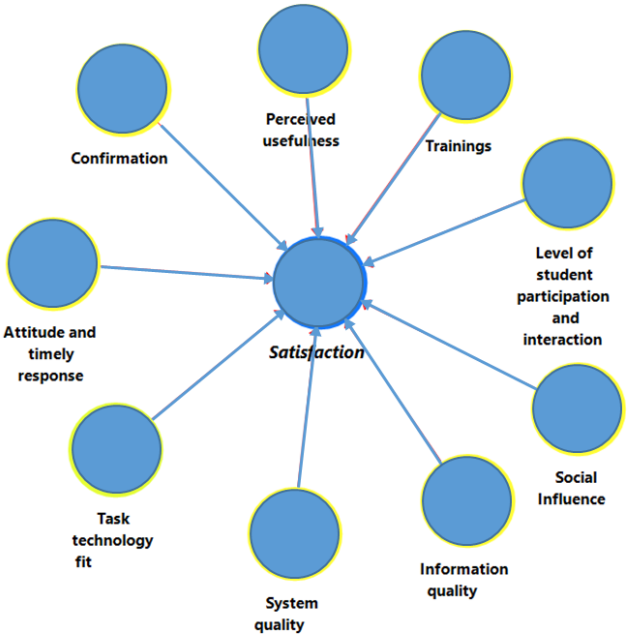


Figure 01: Conceptual Model.

2.2 Sampling & Data collection procedure

This study involved a cross-sectional online survey (Google form) among the National university lecturers in Sri Lanka. The participants were mainly acknowledged based on five specialised fields of Business Management and Finance, Humanities and Social Sciences, Technology, Science, and Arts. Using a convenience sampling technique, 200 questionnaires were distributed via assembled email addresses of academics as meeting in person was restricted due to the COVID-19 epidemic. The time extent for data collection was limited to one week. Accordingly, 128 questionnaires were collected by the end of the week (The response rate was 64%).

Table 02: Variables and Measures.

Variable	Factor Loadings
Satisfaction	0.966
Perceived usefulness	0.977
Confirmation	0.970
Attitude and timely response	0.970
Task technology fit	0.961
System quality	0.967
Information quality	0.968
Social Influence	0.968
Level of student participation & interaction	0.961
Trainings	0.958

Source: Survey Data (2021)

The questionnaire was refined through a pilot survey conducted among the selected academic members in one university to ensure that the measures were appropriate and the wording was exact. The format,

and measurement wordings were refined through this process before the primary survey process, which unfolded subsequently.

2.3 Validity and reliability

All nine substantial aspects were assessed using a 5-point Likert scale ranging from 1 to 5 (strongly disagree to strongly agree). The study used variance-based structural equation modelling in SmartPLS since this is appropriate for a relatively small sample and non-normal data distribution (Hair *et al.*, 2011). Then, Kaiser-Meyer-Olkin (KMO) and Bartlett's Tests were used to measure sampling adequacy, and results indicated KMO scores representing an adequate level of sample adequacy greater than 0.8 (see Table 02). Further, factor loadings of all the constructs were more generous than 0.7 with significant P-values (see Table 02 and Figure 02). Reliability was assessed through Cronbach's Alpha whose scores were more outstanding than 0.7, and Composite reliability was more significant than 0.8 (Hair *et al.*, 2010) (see Table 03). Further, the Average Variance Extracted (AVE) method was used to test the convergent validity, and all the constructs' scores were above the threshold of 0.5 (Hair *et al.*, 2010) (see Table 03).

Table 03: Sampling Adequacy, Reliability, and Validity

Variables	KMO	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
System quality	0.967	0.986	0.989	0.936
Positive Attitude & Timely Response	0.971	0.980	0.985	0.942
Confirmation	0.970	0.979	0.985	0.942
Information quality	0.969	0.984	0.987	0.939
Perceived Usefulness	0.972	0.980	0.985	0.944
Social Influence	0.969	0.978	0.984	0.939
Student participation and interaction for lectures	0.962	0.980	0.984	0.925
Task technology fit	0.962	0.980	0.984	0.925
Training program	0.958	0.970	0.978	0.918

Source: Survey Data (2021)

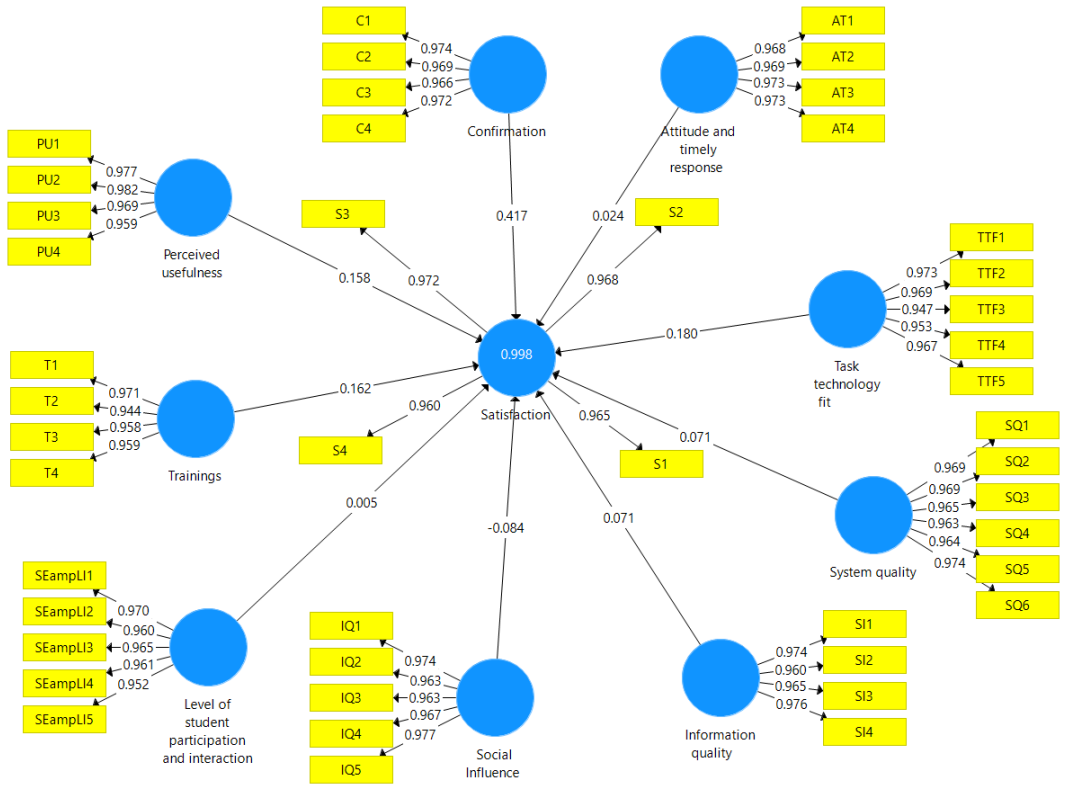


Figure 02: Assessment of the Structural Equation Model.
Source: Survey Data (2021)

3 RESULTS & DISCUSSION

Descriptive statistics were mainly carried out to analyse the demographic profile of the sample. Table 04 summarises the demographic profile of the sample.

Table 04: Demographic Profile of the Sample

Description	%
Specialized Field	
Business Management and Finance	61
Humanities and Social Sciences	19
Technology	16
Science	21
Arts	11
Designation of the Respondents (%)	
Senior Professor	3
Professor	7
Senior Lecturer (Grade I)	23
Senior Lecturer (Grade II)	28
Lecturer	7
Lecturer Probationary	23
Temporary Lecturer	5
Temporary Assistant Lecturer	4
Highest Educational Qualification	
PhD	44
MPhil	6
Master's Degree	28
Bachelor's Degree	22
Gender	
Female	53
Male	47

Source: Survey Data (2021)

As per table 04, respondents represent all universities in the country with five main streams of Business Management and Finance, Humanities and Social Sciences, Technology, Science and Arts. Most of the respondents were designated under the senior lecturers in Grade II and Grade I, respectively, reflecting 28% and 23%. Also, most of the respondents were PhD degree holders, who were recorded as 43%. Further, out of all the respondents, female academics reflected 53% of higher contribution and male academics recorded as 47% in this study.

3.1 Study background Analysis

The background information regarding the respondents and technique were measured using facts established by the authors based on features cited in e- educational literature. Of all the respondents, 51% recorded above-average knowledge regarding Information and Communication Technology (ICT). Many academics' working hours in online teaching were recorded as 8 to 16 hours of the higher category (figure 03). Zoom application was the most popular remote teaching mode in the current university system, while more than half have selected LMS and Microsoft Teams as other significant platforms (figure 04). Additionally, emails, WhatsApp, Social media, Team Viewer were the most widespread Google Apps. Figure 05 shows activities in online teaching. Accordingly, the highest respondents voted for lecture delivery, and more than 50% of respondents elected the assessment and evaluation activities, discussions and meetings, student activities, and research supervision. At the same time, respondents agreed on assignments, presentations and lecturing through online tools, which were the students' most active participation in virtual education. Also, projects, H5P interactive videos, blogs and zoom chats were the minor participative activities in online teaching methods (figure 06).

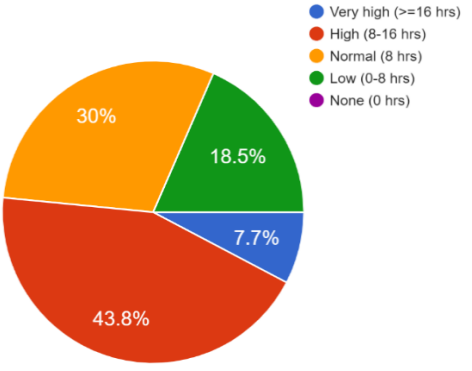


Figure 03: Working Hours in Online Teaching.

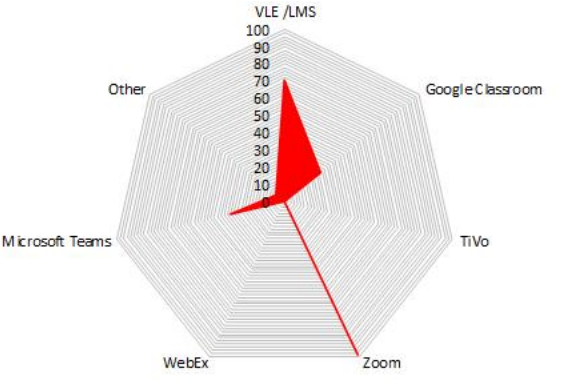


Figure 04: Sources/ Tools / Platforms Used in Remote Teaching

Figure 05: Activities Engaging or Involving in Online Teaching.

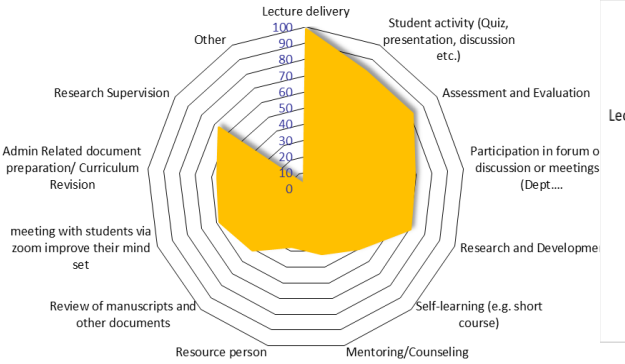
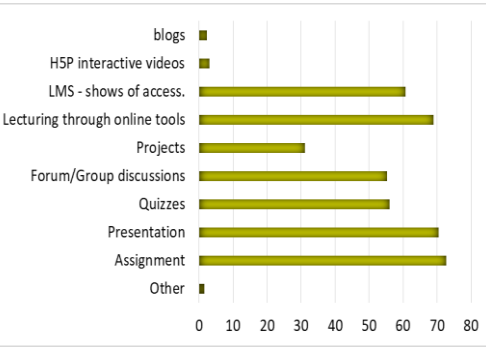


Figure 06: Methods used to Students' Active Participation in Online Remote Learning.



For hypotheses testing, the study utilised variance-based structural equation modelling in SmartPLS and used bootstrapping to assess the path coefficients' significance. Accordingly, 5000 subsamples with the Confidence Interval Method of Bias-Corrected and Accelerated Bootstrap with two-tailed significance at 0.05 were run as a complete bootstrapping (Hair *et al.*, 2017). It was noteworthy that results were the same for both tests, employing P values and T statistics. The T- statistics were measured as per the threshold value of >1.96. With P values, frequently, criterion $P < 0.05$ is used for accepting the hypothesis in this study. The data with the expectation that the links SQ → S, C → S, IQ → S, PU → S, TTF → S and T → S were significant and AT → S, SI → S and SE & LI → S were non-significant at the sample size used (N=128) as shown in table 05.

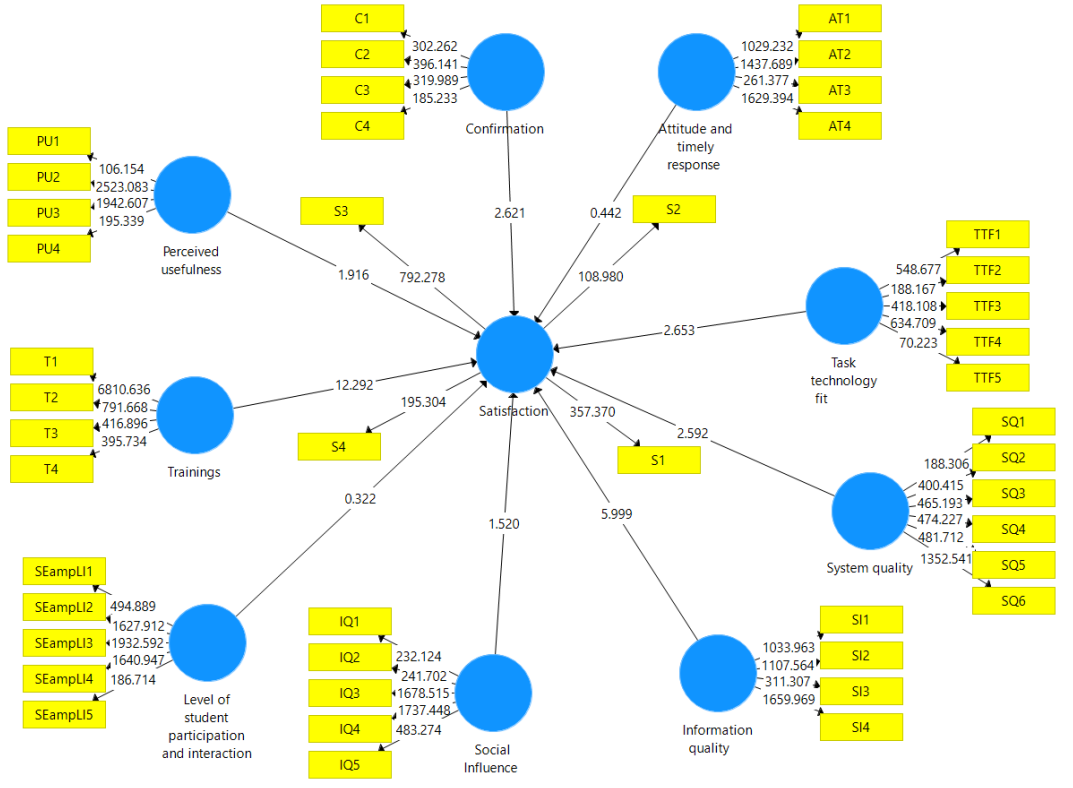


Figure 07: Path PLS T- Value Moderator. Source: Survey Data (2021)

As per the results of figure 07 and table 05, three hypotheses of positive attitude and timely response, social influence, and student participation and interaction for lectures are rejected. Conversely, six dimensions of perceived usefulness, confirmation, task technology fit, system quality, information quality, and training ultimately culminated in the intention of continuation for virtual education (R2 = 0.995).

Table 05: Results of Path Coefficients and Hypotheses Testing.

Hypo:	Path	Path Coefficient	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Result (Support / Reject)
H9	Training program → Satisfaction	0.162	0.234	0.013	12.292	0.003	Supported
H6	Information quality → Satisfaction	0.071	-0.058	0.012	5.999	0.013	Supported
H4	Task technology fit → Satisfaction	0.180	0.149	0.068	2.653	0.059	Supported

H2	Confirmation → Satisfaction	0.417	0.365	0.159	2.621	0.060	Supported
H5	System quality → Satisfaction	0.071	-0.144	0.027	2.592	0.061	Supported
H1	Perceived Usefulness → Satisfaction	0.158	0.316	0.082	1.963	0.098	Supported
H7	Social Influence → Satisfaction	-0.084	0.051	0.055	1.520	0.134	Rejected
H3	Positive Attitude &Timely Response → Satisfaction	0.024	0.103	0.054	0.442	0.351	Rejected
H8	Student participation and interaction for lectures → Satisfaction	0.005	-0.011	0.015	0.322	0.389	Rejected

Source: Survey Data (2021)

3.2 Issues and challenges

Figure 08 illustrates the issues and challenges confronted by academic staff about the online education system in universities.

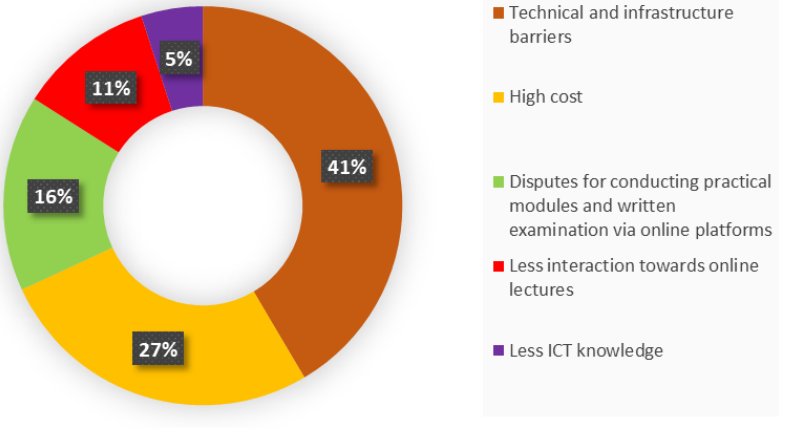


Figure 08: Issues and challenges faced by academic staff about online education.

1. 41% of respondents were experiencing obstructions related to technical aspects and infrastructure, which were mainly cited as data, absence of suitable equipment (modern microphones, headphones, webcams, etc.), weak signal, no signal, unexpected power cuts/losses, power instability, and signal instability.

   Ex: Power failed during lecture time, and Zoom voice was not clear during peak hours.

   Facilities like webcam and microphone were not available in

the room with the old computer which could not meet the present-day demands.

2. Subsequently, 27% of respondents mentioned the high cost of data usages and non-availability of relief packages for online education.
3. The third important challenge of online education was those practical sessions and writing examinations of the degree program, which could not be conducted without physical space.

   Ex: Since we are clinical-oriented degree programs, we feel only 25% of the theory can be delivered through e-learning. However, we need more face-to-face lectures.
4. 11% of respondents were experiencing the common issues of less interactive movement and inability to check students' understanding of lectures.

   Ex: some academics claimed that "it feels like speaking to myself."
5. Still, this study identified students' and academic staff's lack of knowledge and skills in Information and Communication Technology (ICT).

   Ex: We don't have an enabling student culture and a staff culture for online education.

3.3 Suggestions for blended teaching in future

Out of the total, 88% of respondents have agreed with the blended teaching method in future due to the following main reasons.

1. It will improve the IT knowledge also in lecturers as well as in students.
2. Students can watch and repeat the lectures at their convenience at any time.
3. Greater flexibility in managing time with the completion of degree on time.
4. Self-learning and continuation of the teaching and learning under any circumstance supplementing each other.
5. Efficient conducting of guest speeches involving the field expertise of other countries.

High productivity, friendliness, energy savings and easy sharing of knowledge to achieve a comfortable and convenient learning environment in higher education in future.

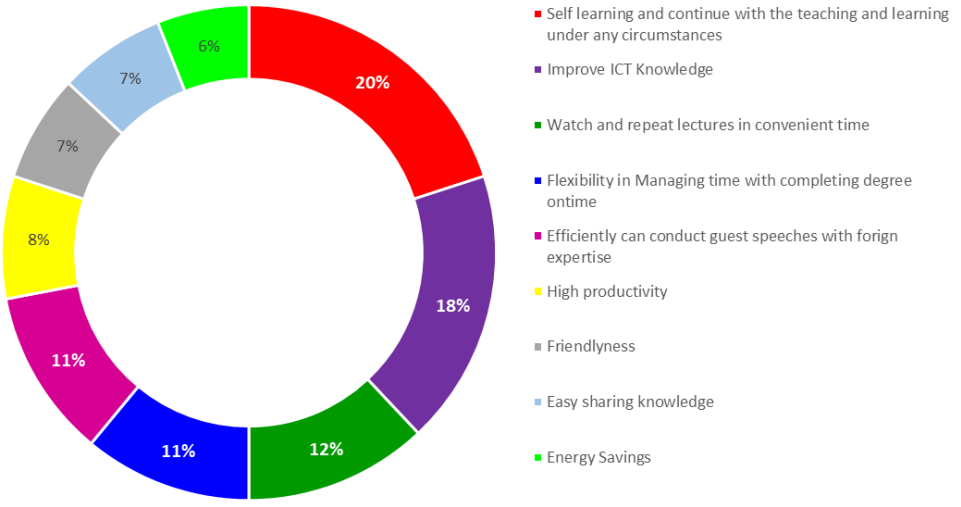


Figure 09: Reasons to recommend the blended teaching methods

12% of respondents have not recommended the blended teaching method in future due to the leading causes of the unfairness of resource distribution, ineffectiveness, less participation, unfamiliarity, technological failures and facilities which have not been developed at optimum level in our country context.

4 CONCLUSIONS

The study explored the university lecturers' satisfaction towards the e-learning system as a mode of lecturing. Accordingly, the results reflected those six hypotheses supported the model, except for the three hypotheses: positive attitude and timely response, social influence, and student participation and interaction for lectures. Accordingly, the study's overall results indicate that the satisfaction of academic staff for e-teaching activities is above the average in terms of perceived usefulness, confirmation, task technology fit, system quality, information quality, and training aspects. Previous studies have verified that perceived usefulness has a positive sign and powerful direct positive effect on users' intention to use the e-education system (Pituch & Lee 2006; Sun *et al.* 2008; Venkatesh *et al.* 2003). This coefficient revealed that every unit increment in perceived usefulness would strengthen an individual's (positive) intention to use an e-learning system. Lecturers' level of confirmation of the e-teaching system significantly positively affects satisfaction towards the online education system. This was significant in most cases in the literature (Bhattacherjeee 2001; Sorebo *et al.* 2009). Task technology fit was one of the core factors that affected instructors' e-learning continuance satisfaction. The previous findings deliberated that task technology fit as one of the leading forecasters of e-learning satisfaction (Sorebo *et al.* 2009; Lin & Wang 2012). As such, higher education institutions must pay further attention to the technological competencies and services of online education systems offered by instructors.

System quality and information quality are both proven to be significant in this study. This result corresponds to Delone & McLean (2003), which indicated that advanced system quality was predictable to greater user satisfaction and positively impacts individual and institutional productivity. While Delone & McLean (2003); Ghasemaghaei & Hassanein (2015) reflected that a higher level of information quality would increase users' satisfaction, it had the highest coefficient scores among the core factors of e-learning satisfaction in their studies. The system quality and information quality were significant in most cases in the literature (Lin & Wang 2012; Chiu & Wang 2008; Raspopovic & Jankulovic 2016). Among all six supported hypotheses, training seems to be the most important supporting factor in this study.

The reason for this may be that online education is a new concept in the Sri Lankan education system. Hence, well-designed training programs can help them be comfortable with the new system and train them to use ICT in delivering lectures effectively. These findings corroborate with Alhabeeb & Rowley's studies in 2018. It was important to build up teachers' confidence and satisfaction in attending training programs related to the online help desk platforms in the Saudi Arabian context. Also, Khasawneh & Yaseen (2017) reflected that faculty members were not eager to integrate technology into their classes due to their technological incompetence. Then, training was incorporated to overcome their fears regarding the technology and new knowledge taken from training enabled them to carry out their work effectively and efficiently. This was the result of a positive effect on academics for online education satisfaction.

Ultimately, this study discussed the issues and challenges faced by academic staff in e-learning system. The facts were technical and infrastructure barriers, high cost, disputes about conducting practical modules and written examination via online platforms, less interaction towards online lectures, and less ICT knowledge. Also, out of the total, 88% of respondents have agreed with blended teaching method in future due to the main reasons of greater flexibility in managing time with the completion of degree on time, improving new knowledge regarding the technology, high productivity, friendliness, energy saving, easy sharing of knowledge, comfortable and convenient learning environment, self-learning and continuation of teaching and learning under any circumstance supplementing each other. A few respondents have rejected the blended teaching methods in the future regarding the unfairness of resource distribution, ineffectiveness, lack of participation, unfamiliarity, technological failures, and facilities not developed at optimum level in our country. To avoid these challenges, the academics have suggested that it will be much useful if there is a proper mechanism to provide lecturers and students with required resources such as conducting continuous quality training programs to understand the semester system, how to proceed a semester system, the importance of regular assessment in semester system, how blended learning is essential in achieving the objectives of semester system and student-centred learning and role of the

technology in modern teaching, etc. Finally, this research provides insights helpful to administrators and researchers to ensure sustainability and scalability of the e-learning system of universities in future.

The results of the present study recommend that elements of perceived usefulness, confirmation, task technology fit, system quality, information quality, and training are the fundamental design principles to stimulate the university lecturers' attitudes to teach effectively through the e-learning system. Conversely, future studies can further investigate why the dimensions of positive attitude and timely response, social influence, and student participation and interaction for lectures did not support lecturers' attitudes towards the e-learning system. Overall, it is evident that academics agree to blended teaching methods in the future while considering the subject content, the ability to use e- teaching in that specific subject, and the nature of the degree program. e.g. some practical modules and written examinations may not be possible via online education. Accordingly, future research must identify the most appropriate methods for designing and teaching online courses. In addition, further research should be focused to examine the variety of technological tools to promote more effective social interaction and growth of learning community, to engage in the online education system actively, for example, audio and video conferencing via Google Hangout, Zoom, Skype, social network media, and virtual reality environments.

ACKNOWLEDGMENTS

Centre for Real Estate Studies (CRES), Department of Estate Management and Valuation, University of Sri Jayewardenepura.

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