Tutor Quality, Facilitating Conditions, and Perceived Usefulness as Predictors of Pre-service Teachers' Satisfaction in an E-learning Environment

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Abstract

Student satisfaction is one of the components used to measure the success and effectiveness of e-learning. This study examined the determinants resulting in pre-service teachers' satisfaction in an e-learning environment. Using structural equation modelling, student satisfaction was assigned as the endogenous variable, while tutor quality, perceived usefulness, and facilitating condition were the exogenous variables. Similarly, the construct was tested for its mediation effect towards student satisfaction from teacher quality and facilitating conditions, respectively. A total of (n=471) pre-service teachers enrolled in one of the colleges of education in Bhutan voluntarily responded to the survey questionnaire that followed a cross-sectional design. The results of the structural equation analyses indicated that student satisfaction was significantly determined by its antecedents, with tutor quality and facilitating conditions taken together resulting in an R^2 of 0.82. Moreover, it was observed that tutor quality and facilitating conditions exerted a positive direct effect on the satisfaction dimension. The results also revealed that perceived usefulness has a statistically positive mediated effect on student satisfaction through tutor quality and facilitating conditions. The model proposed and tested in this study demonstrates that the tutor quality, facilitating conditions, and perceived usefulness can measure the e-learning satisfaction of students. The findings of this research may be helpful for administrators, policy planners and practitioners in the field of e-learning development to identify the elements that affect student satisfaction and further strengthen the existing e-learning programmes, particularly in developing Asian countries.

Keywords: E-learning, e-learning satisfaction, facilitating conditions, perceived usefulness, pre-service teachers, tutor quality, Royal University of Bhutan

Introduction

The growth of e-learning and its relevance in the field of education has been widely recognised and has received so much attention from researchers (Al-Fraihat et al., 2020). Further, dependence on internet technology as a contemporary means of delivering quality education is undeniable, given the widespread use during the pandemic (Elshami et al., 2021; Huber & Helm, 2020; Organisation for Economic Cooperation and Development [OECD], 2020; Ouajdouni et al., 2021). In this study, the term 'e-learning' is used, although the definition of e-learning is controversial as it is known by many different names (Haythornthwaite & Andrews, 2011). According to Haythornthwaite and Andrews, e-learning 'takes place in educational settings and through the technologies of virtual learning environments' (p.45). Within the context of this study, e-learning means the use of a virtual learning environment (VLE) such as Moodle.

In recent decades, the use of such technologies helped many universities, colleges, and schools disseminate curricular content during the pandemic. The value of such technologies is in the integration of e-learning into the education system, thereby increasing flexibility for both teachers and learners in terms of access (George & Lal, 2019; Teo, 2011). Additionally, these technologies provide cost-effectiveness (Kisanjara et al., 2017); and promote students' independent learning (Mutambik, 2018). Indeed, the notions of 'self-directed' and 'self-regulated' learning are embedded within the evolving discourse associated with the affordances of e-learning (Amandu et al., 2013; Robertson, 2011; Saks & Leijen, 2014). For these reasons,

higher education institutions (HEIs) of many countries, including Bhutan, use e-learning systems.

While numerous research studies have advanced our understanding related to information systems (IS) use and e-learning, a substantial portion of these studies places emphasis on user acceptance and adoption (Al-Hajri et al., 2018; Gautam et al., 2021; Khadam et al., 2018; Lee et al., 2014; Pham & Tran, 2020; Venkatesh et al., 2003; Zhou, 2016); intention to use (Huang et al., 2019; Khadam et al., 2018; Teo et al., 2019); factors affecting the acceptance (Azizi et al., 2020; Damnjanovic et al., 2015; El-Masri & Tarhini, 2017); continued usage intentions (Ashrafi et al., 2020; Bhattacherjee, 2001; Lee, 2010; Saeed et al., 2021; Tran et al., 2019; Zhang et al., 2014); and perceived challenges and benefits of using e-learning (Khan et al., 2021; Kumar, 2018). These studies demonstrate that studies in the past were either concerned with technology use or technology itself (Al-Fraihat et al., 2020). Further, studies in the past have shown inconsistent results in terms of student online learning satisfaction (Zeng & Wang, 2021).

Additionally, the dimensions used to predict student satisfaction in HEIs was somewhat aberrant and therefore, different researchers applied dissimilar constructs. The use of varying variables to develop e-learning success models, have consequently, led to confusion, among the researchers (Al-Fraihat et al., 2020). Some of the widely used constructs pertaining to e-learning satisfaction in the literature include: information quality, system quality, service quality, intention to use/use, user satisfaction (Mtebe & Raphael, 2018) who used the modified and updated DeLone and McLean (D & M) (2003) model; learner dimension, instructor dimension, course dimension, technology dimension, design dimension, and environmental dimension (Sun et al., 2008); perceived usefulness, learning environment, course delivery, tutor attribute, and facilitating conditions (Teo, 2011); course delivery, tutor quality (TQ), perceived usefulness (PU), perceived ease of use, facilitating conditions (FC), (Teo, 2010, 2013, 2014). While previous research has attempted to explore e-learning satisfaction in higher education institutions (HEIs) across diverse cultural contexts, employing factors such as TQ, FC, and PU to gauge satisfaction (Teo, 2010, 2011), this study aimed to enhance the understanding of the relationship between student satisfaction, particularly with TQ and FC, by examining PU as a mediating variable.

Past studies have indicated a positive relationship between PU and student satisfaction (e.g., Ouajdouni, 2021). In some studies, PU was used as the direct determinant of student satisfaction (Al-Rahmi et al., 2015), while others treated PU as the dependent variable (Teo, 2011). Further, some scholars suggested satisfaction as a mediating variable (Ouajdouni, 2021). Likewise, study by (Teo, 2011) called for inclusion of facilitating conditions to measure e-learning course satisfaction, however, Teo's study did not find a positive relationship between satisfaction and FC. It is believed, availability and accessibility of technological infrastructure facilities have a direct relationship with the success of e-learning (Biyiri & Dissanayake, 2021). At the same time, previous researchers have indicated that tutor quality positively correlates with pre-service teachers' satisfaction (Ouajdouni et al., 2021; Teo, 2010; Teo & Wong, 2013) and the importance of TQ as a test variable have been established by several past studies (Jiménez-Bucarey et al., 2021; Teo, 2010, 2011).

Considering the high stakes in e-learning and the increasing reliance on technologies in the learning environment, there was a call for further study to identify and explore new factors related to user acceptance and satisfaction with technology (Lee, 2010). Besides, based on the available literature, the use of constructs to measure student satisfaction has advanced along different lines, leading to the use of numerous variables to empirically test and validate satisfaction constructs (Martín-Rodríguez et al., 2015). Therefore, a need is felt to study student satisfaction using TQ, FC and PU as the determinants of satisfaction, as there is limited research, particularly in the context of HEIs in developing countries. This study is different from earlier studies, even though similar latent constructs were utilised by previous research. The present study is the first to empirically establish the relevance of TQ, FC, and PU in

predicting student satisfaction in the e-learning context. Using structural equation modelling (SEM), drawing from the extant research, satisfaction was considered the endogenous variable, with TQ, FC, and PU as exogenous variables. Also, earlier studies using these factors or constructs have all been conducted in developed countries (Teo, 2010, 2011).

This study explored the determinants resulting in pre-service teachers' satisfaction in an e-learning environment in one of the colleges of education in Bhutan. Specifically, this study aimed to: identify the impact of FC, TQ on student satisfaction; investigate the effect of TQ and FC on student satisfaction; ascertain the impact of PU on student satisfaction; and finally assess the mediating role of PU on student satisfaction on the linkage between FC and TQ.

Literature Review and Research Hypotheses

This section discusses some of the key concepts, theories, and empirical findings that inform and contextualise the research providing support for the proposed research hypotheses. Through this review, several theoretical frameworks are constructed, highlighting their significance. In recent times, a considerable amount of research concentrates around student satisfaction as a relevant measure of quality education and as an indicator of IS effectiveness and success, particularly in the context of e-learning (Alqurashi, 2019; Atchley et al., 2013; Baber, 2020; Martín-Rodríguez et al., 2015; Teo, 2010; Teo & Wong, 2013). Several research studies have since attempted to explore the e-learning satisfaction of the students (Baber, 2020; Jiménez-Bucarey et al., 2021; Elshami et al., 2021; Quispe & Alecchi, 2021; Naseer & Rafique, 2021; Ouajdouni et al., 2021; Simanullang et al., 2021; Thach et al., 2021).

Quispe and Alecchi (2021) explored the graduate business students' satisfaction and dissatisfaction using a qualitative research method. Similarly, Ouajdouni et al. (2021) studied the relationship between e-learning system success and satisfaction. Likewise, Jiménez-Bucarey et al. (2021) proposed a model to measure medical students' satisfaction considering three dimensions: teacher quality, technical service quality and service quality. Baber (2020) study employed five factors to study student satisfaction: interaction in the classroom, student motivation, course structure, instructor knowledge, facilitation, and perceived learning outcome, which was used as a mediating variable. Additionally, Naseer and Rafique (2021) examined the moderated role of Teachers' Academic Support between Students' Satisfaction with Online Learning and Academic Motivation in Undergraduate Students. Weerasinghe and Fernando (2017) defined satisfaction as "a short-term attitude resulting from an evaluation of students' educational experience, services, and facilities" (p.533). The research model is presented in Figure 1.

Tutor Quality

Irrespective of the learning environment, quality tutors are indispensable for the success of any learning programme. Tutors have even greater responsibilities in the context of the e-learning environment (Mtebe & Raphael, 2018) due to the shift in roles. The role of tutors in an e-learning context changes to facilitator and guide from being a mere knowledge transmitter (Teo, 2011). Previous researchers have indicated that tutor quality positively correlates with pre-service teachers' satisfaction (Ouajdouni et al., 2021; Teo, 2010; Teo & Wong, 2013). Similarly, past study by Ouajdouni et al. (2021) showed that tutor quality could also explain variance in perceived usefulness. Hence, the construct, tutor quality, is expected to contribute to student's e-learning satisfaction. The following hypotheses were formulated:

H_1: Tutor quality has a positive effect on the e-learning satisfaction of the students.
H_4: TQ has a positive effect on PU

Perceived Usefulness

Davis et al. (1989) defined perceived usefulness as "a perception an individual has about the usage of a particular system which is beneficial for his/her job performance" (p. 453). Previous researchers have repeatedly indicated a positive relationship between perceived usefulness and student satisfaction in an e-learning context (Ali, 2012; Ouajdouni et al., 2021; Teo, 2011, 2013, 2014). The importance of perceived usefulness in predicting course satisfaction has also been reported by (Teo & Wong, 2013). Likewise, Sun et al. (2008) found that learners' perceived usefulness correlated positively with their level of satisfaction. While most prior research supports the claim that PU is a direct determinant of student satisfaction, Al-Rahmi et al. (2018) observed an indirect but positive relationship between perceived usefulness and satisfaction. Based on this discussion, the hypotheses reported are:

H_3: PU has a positive effect on the e-learning satisfaction of the students.
H_6: PU has a positive mediation effect on the relationship between TQ and Satisfaction
H_7: PU has a positive mediation effect on the relationship between FC and Satisfaction

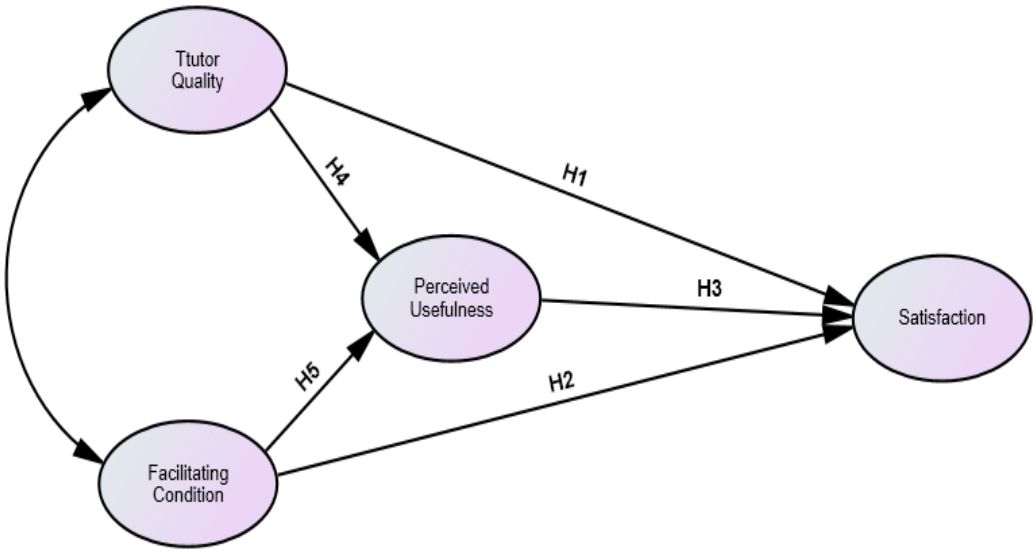
Facilitating Conditions

Facilitating condition (FC) is defined as "the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system" (Venkatesh et al., 2003, p 453). According to some earlier studies, FC was found to be a significant determinant of PU (Sukendro et al., 2020). However, the association between FC and student satisfaction in the e-learning context was considered insignificant (Teo & Wong, 2013). Nevertheless, Rahmi and Birgören (2020) emphasised that the need for FC is critical for the success of e-learning. Therefore, it is hypothesised that:

H_2: Facilitating condition has a positive effect on e-learning satisfaction of the students
H_5: FC has a positive effect on PU.

Figure 1

The Research Model



Methodology

This study used Structural Equation Modelling (SEM) to explain the relationships between the variables under investigation. SEM is a robust statistical method that allows researchers to investigate the direct relationships between variables, as well as the underlying latent constructs and the indirect pathways by which they influence one another. This method facilitates a more comprehensive understanding of the intricate interplay of factors and allows for the assessment of the goodness of fit between the theoretical models, thereby enhancing the rigour of the analysis.

Target Sample

A purposive sampling technique was deployed to select the participants. The study used a cross-sectional quantitative survey approach to investigate user satisfaction based on four selected constructs from literature. The primary endogenous variable considered for data collection and analysis was student (user) satisfaction. The other three predictor constructs were TQ, FC, and PU. Study samples were taken from one of the colleges of education. The data for this study was collected with assistance from college lecturers. The participants comprised undergraduate pre-service teachers, with a total of 471 respondents (192 male) and (277 female) who completed the online survey. The chosen sample size (n=471) exceeded the minimum requirement of 200, as suggested by Boomsma (1987).

Data Collection and Analysis

This cross-sectional study purported to investigate the user satisfaction of e-learning in a mandatory teaching and learning environment. The questionnaire items were adapted from extant empirical literature. For this purpose, TQ (8 items) were adapted from (Teo, 2010); PU (5 items) from Davis (1989); the four items of FC were incorporated from Venkatesh et al. (2003) study, and satisfaction items (7) were taken from Wang (2003) and Lee (2010) study. The responses were measured in 5 points Likert scale, and the anchor ranges from “1 as strongly disagree” to “5 as strongly agree.” Overall, the research instrument used 24 items, achieving the minimum requirement for preparing good questions as suggested by (Hair et al., 2010).

Descriptive statistics was analysed mostly using R Studio, and SPSS Amos 26 was used to compute: Exploratory Factor Analysis (EFA), confirmatory factor analysis (CFA) and structural Equation Modelling (SEM). Before CFA and SEM model formation, an EFA using “Principal Axis Factoring” was applied along with Cronbach's reliability testing. To check for univariate and multivariate normality, Mardia's measure of kurtosis and Skewness was used based on the recommendation of Teo (2010). Further, Common Method Bias (CMB) using three different methods were applied.

Results

This section transitions from the theoretical and methodological foundations established in preceding sections to the empirical insights derived from the data analysis. Descriptive analyses and several methods to ascertain the reliability and validity of the data are presented in upcoming sections:

Descriptive Analyses

To assess the univariate normality of the data, descriptive statistics were computed. The mean values for the 24 items ranged from 3.3870 to 4.0445. The standard deviations varied from .632-.817. The skewness values ranged from -1.99- (-.949), while the kurtosis values ranged from 0.047-1.885. The skewness-kurtosis values were well within the recommended range of (3) and (8) (Kline, 2016). Therefore, the dataset is assumed to be sufficiently univariate normal suitable for further multivariate analysis.

Common Method Bias

In order to test for any potential presence of common method bias (CMB) between the independent and dependent variables, three CMB statistical tests were applied. The first and second were computed with (SPSS) while (Amos) was used for the third. First, Harman's one-factor test using unrotated EFA with all items from all constructs were loaded onto a single factor. The first component total Eigenvalue was (8.872) with a variance extraction result of (36.99%) which is less than 50% as suggested by Podsakoff et al. (2012) or even lesser than the conservative thresh-hold of 40% variance suggested by (Hair et al., 2019). Second, a correlation matrix method was employed to test the CMB. The (correlation) values between the two variables were all less than the threshold value of (0.90) as recommended by Kline (2016). Finally, using the common Latent Factor (CLF) method, the standardised regression weights between the models; with CLF and one without CLF, the Delta (™) values for all items within the two CFA models were also insignificant (< 0.20). Therefore, a non-significant value from these tests confirms that CMB is an unlikely concern for this present study.

Reliability Analysis

Since the 26 items for this study were adapted from various previous studies, an EFA, a dimension reduction technique, was necessary and thus applied (Hair et al., 2019). Using a "Principal Axis Factoring" method and the "Promax" rotation method with Kaiser Normalization, there could be four factors extracted after removing two items that had factor loadings (< 0.40). The 24 observed variables had an extraction variance of 54.93%. The Kaiser-Meyer-Olkin (KMO) value of .930, which is (> 0.70) a minimum threshold, confirmed the measures of sampling adequacy (MSA) suitable to estimate the factor analysis (Hair et al., 2019). The Bartlett's test of sphericity test statistic (Approx. Chi-Square= 6100.069, df = 325, sig-value = 0.001).

Table 1

The Exploratory Factor Analysis Result

Items	Factor			
	TQ	SAT	PU	FC
TQ1	.517			
TQ2	.610			
TQ3	.507			
TQ4	.562			
TQ5	.612			
TQ6	.455			
TQ7	.591			

TQ8	.635			
Sat1		.677		
Sat2		.652		
Sat3		.612		
Sat4		.610		
Sat5		.672		
Sat6		.638		
Sat7		.468		
PU1			.688	
PU2			.651	
PU3			.602	
PU4			.661	
PU5			.697	
FC1				.619
FC2				.643
FC3				.684
FC4				.597
Extraction Variance	36.59	8.02	5.31	5.010
Eigen Values	9.516	2.086	1.383	1.303
Cronbach Alpha	0.838	0.852	0.754	.739

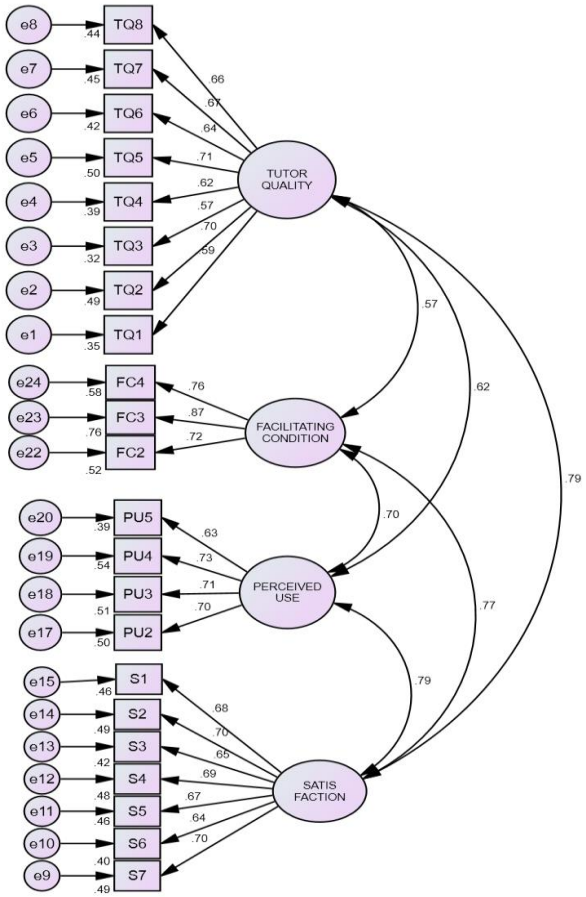
Note. Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization. TQ= Tutor Quality; Sat=Satisfaction; PU=Perceived Use; FC= Facilitating Conditions

Measurement Analysis

Based on the EFA four-factor solution (24 items), a Confirmatory Factor Analysis was performed using the Maximum likelihood estimation (MLE). MLE is the most common technique used in parameter estimation (Hair et al., 2019; Stevens, 1996). Following the recommendation of (Hair et al., 2019), the respective indicator variable loadings < 0.70 were first tested. A good rule of thumb suggested by Hair et al. (2019) is that standardised loading estimates should be 0.50 or higher, ideally 0.70. In this study, standardised loadings estimates were all above 0.05 and hence, no items needed deletion (see Figure 2). In AMOS, modification indices to improve the model is suggested; in this study, no pairs revealed modification suggestions that were so strong and had to be correlated. It can be seen from Table 1 that the results of CFA approached adequate minimum fit. The model yielded ($\chi2$= 503.959; $\chi2$/df=3.76; p=0.001), TLI=0.892, CFI = 0.910, RMSEA = 0.073 |0.066 - 0.080|, SRMR = 0.05). Although many studies suggest that the preferable relative chi-square test is <3 (Hair et al., 2019; Kline, 2016), this study adopts Schumacker and Lomax (2004) where $\chi2$/df (<5) is considered acceptable "badness of fit" measure. The Tucker-Lewis index or TLI (0.892) have values close to > 0.90 or, in other words, are somewhat close to the threshold value of 0.90.

Figure 2

The Measurement Model



Construct Reliability, Convergent Validity, and Discriminant Validity

Composite reliability for all the factors was > 0.7. The convergent validity for this paper is achieved as all the CR>AVE. Also, all AVE values were greater than 0.5. Further, to assess the discriminant validity Fornell and Larcker (1981) criterion was used. Discriminant validity was also achieved as the MSV values are lesser than AVE, and ASV values were all lesser than AVE. Moreover, all the square roots of AVE are greater than inter-construct correlation values (see Table 2).

Table 2

Construct Reliability, Convergent and Discriminant Validity

	Variance and reliability				A factor correlation matrix with √AVE on the diagonal			
Construct	CR	AVE	MSV	ASV	TQ	Sat	PU	FC
TQ	0.84	0.63	0.61	0.45	0.79			
Sat	0.85	0.67	0.64	0.62	0.78	0.82		
PU	0.77	0.63	0.52	0.51	0.62	0.80	0.79	
FC	0.75	0.64	0.61	0.49	0.58	0.78	0.72	0.80

Note. TQ= Tutor Quality; Sat=Satisfaction; PU=Perceived Use; FC= Facilitating Conditions

Structural Model and Hypothesis Testing Results

A full SEM was used to examine the relationships between the constructs. According to Collier (2020), a full SEM is a robust measure as it accounts for measurement errors of all the indicator variables within the model. Before estimating the model's structural part, the multicollinearity assumptions were assessed for TQ, PU, and FC following the recommendation of Hair et al. (2019). The calculated variance inflation factor (VIF) was TQ (1.479), PU (2.107), and FC (2.214), where VIF values, in this case, were all within the accepted threshold (< 5). Further, the Tolerance value for the three constructs was significant (> 0.2). Therefore, generated VIF and Tolerance values confirm that this study has no multicollinearity issues.

Next, two endogenous variables, PU and Satisfaction were examined (see Figure 3), while FC and TQ were treated as exogenous variables. Satisfaction of e-learning users (students) was the main endogenous variable considered for this study. Also, PU is treated as mediating between TQ and FC towards satisfaction. The model yielded ($\chi2$= 534.040; $\chi2$/df=3.709; p=0.001), TLI=0.857, CFI = 0.903, RMSEA = 0.076 |0.069 - 0.083|, SRMR = 0.05). While several studies recommend a preferable relative chi-square test of <3 (Hair et al., 2019; Kline, 2016), this study adheres to the criterion established by Schumacker and Lomax (2004), considering $\chi2$/df (<5) as an acceptable "badness of fit" measure. The Tucker-Lewis index or TLI (0.892) has values somewhat close to > 0.90, indicating a proximity to the threshold value of 0.90.

The results of hypothesis testing is presented in Table 3 for H1 (β= 0.402, t= 7.087; p <0.001), H2 (β= 0.299, t= 5.258, p <0.001); H3 (β= 0.327, t= 5.092, p <0.001); H4 (β= 0.517, t=7.641, p <0.001); H5 (β= 0.338, t= 5.143, p <0.001) have significant positive direct influences on the student satisfaction of online learning in a mandatory setting (see Figure 3). The results of the model accounted for 82% variance in student satisfaction in an online learning environment. Further, TQ and FC accounted for 56% variance in PU.

Table 3

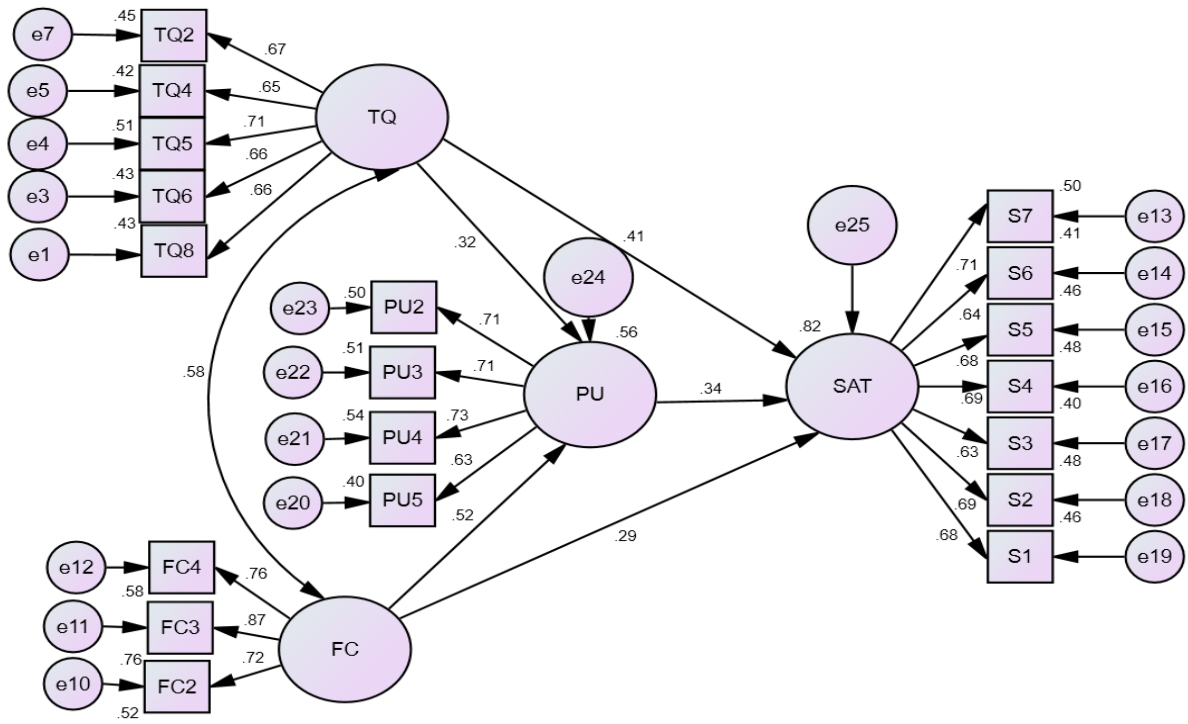
Results of a Structural Equation Modelling

Relationships	Estimates	Critical ratios	P-value	Results
1SAT<---TQ	0.402	7.087	0.001	Supported
2SAT<---FC	0.299	5.258	0.001	Supported
3PU<---TQ	0.327	5.092	0.001	Supported
4PU<---FC	0.517	7.641	0.001	Supported
5SAT<---PU	0.338	5.143	0.001	Supported

Note. Critical ratios are significant at p < 0.001 CR values exceeding 1.96

Figure 3

Structural Research Model



Similarly, to test the formulated hypotheses (6 and 7), a bootstrapping resampling method with 5000 replication was requested. Results of the indirect effects of TQ and FC through PU were found to be significant ($p<0.001$) at the 95% confidence level TQ>>PU ($\beta=0.103$, $t_{4999}=10.18$; CI=|0.079|-|0.128|) and FC>>PU ($\beta=0.203$, $t_{4999}=20.10$; CI=|0.164|-|0.247|) respectively. The Standardised path coefficients, t value, and the percentile bootstrap at 95% confidence interval of direct and indirect effects on online student satisfaction are shown in Table 4.

Table 4

Test for Mediation Using a Bootstrap Analysis with a 95% Confidence Interval

Relationships	Direct Effect	Indirect Effect	Confidence Interval		p-value	Conclusion
			Low	High		
TQ>PU>Sat	0.311 (10.18)	0.103	0.079	0.128	<0.001	Partial Mediation
FC>PU>Sat	0.613 (20.106)	0.203	0.164	0.247	<0.001	Partial Mediation

Note. Standardised coefficients were reported. Values in parentheses are t-values. Bootstrap sample = 5,000 with replacement.

Discussion

The primary aim of this study was to explore the determinants resulting in pre-service teachers' satisfaction in an e-learning environment. It explored the effects of TQ, FC on student satisfaction, additionally exploring the mediating role of PU on student satisfaction from TQ and FC. The results of the structural equation modelling analyses indicated that student satisfaction is indeed an important determinant in e-learning context, aligning with findings highlighted in preceding research (Baber, 2020; Teo, 2010, 2013, 2014; Teo & Wong, 2013). Taken together, the results of this study revealed that antecedents, namely TQ, PU, and FC, have significantly determined satisfaction resulting in an R^2 of 0.82, which explained the 82% of the variance in satisfaction. The results of this study showed that TQ is a better predictor of satisfaction compared to FC. Thus, the higher predictive ability of TQ underscores the crucial role and quality of teachers in the e-learning context for students to experience a higher level of satisfaction. Statistical results of this study support hypotheses H1, H2, and H3. Students would feel satisfaction if they felt that the TQ, FC and PU were adequate. The results concerning TQ are consistent with previous studies (Teo, 2011) since the tutor is the key person who is important to learners in the e-learning context (Diep et al., 2017; Mtebe & Raphael, 2018). Moreover, students' satisfaction with e-learning is positively influenced by tutor quality (Teo, 2014). According to Teo and Wong (2013), the "course tutors or instructors play a key role by planning the curriculum and employing pedagogical strategies to harness available technologies in ensuring the success of e-learning." Therefore, the finding of this study concerning the TQ construct confirms the vital role tutors play in the success of e-learning.

Similarly, previous research that indicated PU to have a significant relationship with satisfaction is confounding (Rahmi et al., 2018). The result indicating a significant positive relationship between PU and student satisfaction in the e-learning context aligns with the findings reported by Teo and Wong (2013). Their study found that when students were satisfied with e-learning, course success also improved. The same results were achieved by Ali (2012) and Sun et al. (2008), where a strong positive relationship between students' level of e-learning satisfaction and perceived usefulness occurred, who argued that this construct only indirectly influences user satisfaction. However, the findings of this study established a direct positive relationship between TQ and user satisfaction, explaining 41 percent of the variance in satisfaction. Nevertheless, the finding of this study is inconsistent with the results reached by Al-Rahmi et al. (2015), who argued that TQ has indirect influence on users' satisfaction. The results of this present study showed a direct positive relation between TQ and users satisfaction explaining 41 percent variance in satisfaction.

Comparably, statistical results further confirmed that TQ and FC exerted a positive significant direct effect on student satisfaction and that, TQ was a better predictor of PU compared to FC. The finding of this study for TQ concurred previous research findings where TQ had shown a positive direct relationship with pre-service teacher's satisfaction (Ouajdouni et al., 2021; Teo, 2010; Teo & Wong, 2013). However, results on FC having a positive effect on satisfaction in this study contrast with findings of Teo and Wong (2013), where they did not find a significant and direct relationship with e-learning satisfaction. Further, the indirect effects suggest that perceived usefulness has a positive and significant mediated effect on student satisfaction through TQ and FC. A positive indirect relationship between FC and PU was consistent with what was reported (Sukendro et al., 2020).

Conclusions and Implications

Numerous prior research had suggested student satisfaction as a relevant measure of e-learning success (Alqurashi, 2019; Baber, 2020; Teo & Wong, 2013). Based on the data and statistical analyses, the results of this study confirmed that the three predictors, TQ, FC, and PU, are relevant determinants of student satisfaction. While the data for this study were collected from only one constituent college of RUB, this study may have potential theoretical implications within the RUB colleges. Further, the findings of this study may have significant implications that could be useful to other developing Asian regions using e-learning both presently and in the future. As noted earlier, the proposed predictors in this study exhibited a good fit based on the data in determining e-learning satisfaction.

Thus, this study makes two important contributions to the e-learning satisfaction literature in the context of developing country's HEIs perspective. First, past studies have investigated numerous antecedents of e-learning student satisfaction (e.g., Teo, 2011; 2013). However, TQ, FC, PU, and satisfaction have never been tested, consequently receiving limited research attention from scholars in the field of educational technology. This present study addresses this gap by empirically establishing a link between student satisfaction, TQ, FC, and PU. The results of this study imply that TQ, FC, and PU as a construct are likely to have a significant positive influence on student satisfaction. Second, perceived usefulness as a mediating variable of student satisfaction in the context of e-learning student satisfaction is scarce. This study, therefore, offers valuable understanding into how perceived usefulness contributes to improving student satisfaction. Future researchers in similar contexts may consider using the proposed model to measure e-learning satisfaction. The present study found and empirically established a link between student satisfaction, tutor quality, facilitating conditions, and perceived usefulness. Moreover, tutor quality, facilitating conditions and perceived usefulness, as a construct are likely to have a significant positive influence on student satisfaction.

Limitations and Future Research Directions

This study is not exempt from some limitations. The responses and data for the study were only collected from one college under RUB; therefore, the results obtained are not representative of all eight RUB constituent member colleges. Consequently, suggestions about result generalisation must be approached with care. A suggestion to involve representation from all the colleges of RUB may be useful to enhance generalizability and to further improve the construct validity and the reliability of the study.

Likewise, the focus of the present study was on assessing the impact of TQ and FC on student satisfaction with mediating the role of perceived usefulness. This present study explored the role of only one mediator (PU). However, future research could explore other variables such as TQ and FC as mediating variables as this present study identified a positive relationship between TQ and Satisfaction, as well as between FC and satisfaction. It is further recommended that, in subsequent studies, researchers could consider including other variables such as learner dimension, course dimension, technology dimension, perceived ease of use to assess the overall quality of e-learning (Al-Fraihat et al., 2020). Teo (2011, 2013) also suggested the inclusion of these variables, as they were revealed to have positively affected student satisfaction. Inclusion of perceived ease of use in future studies could also explain the direct effect on attitudes towards using technology, and ultimately, influence the intention to use technology and to ultimately improve student satisfaction (Jang et al., 2021; Tarhini et al., 2016). It is also possible for future researchers to consider demographic information as either moderating or as control variables in enhancing the overall model fit. Equally important, a comparative study between the online and face-to-face learning satisfaction is desirable.

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